ENVIRONMENTAL ASSESSMENT

for the

Free and Easy 2 Forest Management Project

(EA# OR110-00-15)

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MEDFORD DISTRICT
GRANTS PASS RESOURCE AREA

November 2000

Dear Reader:

We appreciate your interest in the BLM's public land management activities. We also appreciate your taking the time to review this environmental assessment (EA). If you would like to provide us with written comments regarding this project or EA, please send them to me at 3040 Biddle Road, Medford, OR 97504. If you would prefer, you may also email comments to me at: *or110mb@.or.blm.gov.*

If confidentiality is of concern to you, please be aware that comments, including names and street addresses of respondents, may be made available for public review or may be held in a file available for public inspection and review. Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must clearly state this at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations, or officials of organizations or businesses, will be made available for public inspection in their entirety.

Abbie Jossie
Field Manager
Grants Pass Resource Area

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MEDFORD DISTRICT

EA COVER SHEET

RESOURCE AREA: *Grants Pass* FY & REPORT # EA Number OR-110-00-15
ACTION/TITLE: *Free and Easy 2 Forest Management Project*
LOCATION: T. 38 S. R. 8.W, Section 33
T. 39. S, R. 8 W., Sections 5, 11, 14, 15, 23, and 25, Willamette Meridian
FOR FURTHER INFORMATION CONTACT: Abbie Jossie
Medford District Office, BLM
3040 Biddle Road
Medford, Oregon 97504
(541) 618-2303

INTERDISCIPLINARY PREPARERS	TITLE	RESOURCE VALUES ASSIGNED
Frank Hoeper*	Forester	EA Writer
Matt Craddock	Realty Specialist	Minerals, Lands, and Cultural
Kip Wright*	Wildlife Biologist	Prime or Unique Lands, Wildlife, Grazing, and Fisheries
Dave Maurer	Soil Scientist	Floodplains, Wetlands, Soils, and Water
Jon Raybourn	Fisheries Biologist	Fisheries
Jeanne Klein	Recreation Planner	Recreation, VRM
Jim Roper	Engineer	Roads, Quarries, Road Agreements, Easements
Linda Mazzu	Botanist	T&E Plants
Tom Murphy	Fuels Specialist	Fire, Slash Treatment
Bob Murray*	Forester	Logging Systems, Team Leader
Don Bellville* / Frank Betlejewski	Foresters	Vegetation, Silviculture

GRANTS PASS RESOURCE AREA
ENVIRONMENTAL ASSESSMENT

TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

Chapter 1
Purpose of and Need for Action

A. Introduction

The purpose of this environmental assessment (EA) is to assist in the decision making process by assessing the environmental and human affects resulting from implementing the proposed project and/or alternatives. This EA will also assist in determining if an environmental impact statement (EIS) needs to be prepared or if a finding of no significant impact (FONSI) is appropriate.

The Free and Easy 2 Forest Management Project EA includes a re-evaluation of the 1995 Free and Easy Timber sale (EA #OR110-96-03) area with the addition of two parcels of land: T.39S.,R.8W., Sections 14 and 23. The Free and Easy sale was initially offered for sale in January 1996 but received no bids at that auction. It was reoffered on February 8, 1996 and received no bids. Beginning in the spring of 1998, an interdisciplinary team began review of the earlier project area, expanded it and changed some of the proposed actions. The present Free and Easy 2 Forest Management Project proposal is the result is the result of this analysis. The present EA addresses the project proposal in its entirety.

This EA tiers to the following documents:

(1) the Final EIS and Record of Decision dated June 1995 for the Medford District Resource Management Plan dated October 1994 (RMP-ROD);
(2) the Final Supplemental EIS on Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl dated February 1994; and
(3) the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl and its attachment A entitled the Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl dated April 13, 1994 (NFP-ROD).

In addition to the documents cited and tiered to above, the planning of this project drew from the ideas, information and recommendations of the following documents:

(1) USFWS Biological Opinions #1-7-96-F-267 (1996) and #1-7-98-F-321 (Sept 18, 1998)
(2) Watershed Analyses for the Kerby and the East Fork of the Illinois River.
(3) Free and Easy timber sale EA (1995) and public comments regarding this project.

To assist the reader, a glossary of selected terms is included in the Appendix. The definitions are from the Medford District RMP.

B. Purpose and Need for the Proposal

The broad purpose of the proposed action is to implement the Medford District's Resource Management Plan (RMP). The proposed action is designed to meet a variety of resource and human (social/economic) needs and objectives outlined in the RMP. These include:

- contribution to the Medford District's timber harvest / forest products commitment, thus helping meet the demand for wood products both regionally and nationally and supporting local and regional economies;

- management of the forest land in a manner that will provide for and promote a wide variety of non-commodity outputs and conditions including wildlife habitats, sustainable forest conditions, recreation opportunities, maintenance or improvement of water quality, and fisheries.

C. Project Location

The general location of the proposed project is shown on Map 1: Project Vicinity Map. (All maps are located in Appendix A.)

D. Issues and Concerns Relevant to the Project

A variety of issues and concerns were raised during the scoping of this project and the scoping of the earlier Free and Easy timber sale. These were identified by interested individuals or groups outside of the BLM, by the Resource Area's project planning and Interdisciplinary (ID) teams. Pertinent issues have also been drawn from some of the documents noted above. The major issues identified as pertinent to the project are listed below. Many of these issues were used in the design of the proposed project and alternatives.

1. There are western big-eared bats (*Corynorhinus townsendii*), a bureau species of concern, utilizing Lime Rock Cave, Chapman Creek Cave, and other nearby caves.

2. The current high stand densities throughout the project area are resulting in a decline in the amounts of vigorous pine, oak, and Douglas-fir.

3. Meadow habitats are declining due to brush and/or tree encroachment.

4. There is a high fire hazard and risk in the project area due to both high stand densities and the increasing numbers of rural homes adjacent to the project area.

E. Land Use Allocation Objectives

The project area is located in the Matrix Land Allocation (NFP / RMP) and within the Southern General Forest Management Area identified in the RMP. Specific objectives for this land allocation are discussed in the RMP-ROD (p. 38-39). Within the project area are a number of springs and streams. These are within the Riparian Reserve land allocation. Riparian Reserve objectives are enumerated in the RMP-ROD (pp. 28-31).

Chapter 2
Proposed Action and Alternatives

A. Introduction

This chapter describes the proposed action and alternatives that are addressed and analyzed in this EA.

B. Alternative 1: No Action Alternative

In this EA the "no-action" alternative is defined as not implementing any aspect of the proposed action alternative (Alternative 2). Defined this way, the no action alternative also serves as a baseline or reference point for evaluating the environmental effects of the action alternatives. Inclusion of this alternative is done without regard to whether or not it is consistent with the Medford District RMP.

The no action alternative is not a "static" alternative. Implicit in it is a continuation of the environmental conditions and trends that currently exist or are occurring within the project area. This includes trends such as vegetation succession and consequent wildlife habitat changes, road condition / deterioration, rates of erosion, continuation of current road densities, trends in fire hazard changes, OHV use, *etc*..

C. Alternative 2: Proposed Action

1. Introduction

This section of the EA describes a series of project proposals which together comprise the Free and Easy 2 project. It is organized and presented based on broad "types of action" (*e.g.* road actions, riparian treatments, fisheries enhancement, vegetation treatments, wildlife habitat restoration). Proposals are grouped this way to better present the comprehensive nature of the Free and Easy proposal and to facilitate understanding and analysis of the project. While presented in these discrete groupings, their interrelationship must be kept in mind particularly in considering the potential environmental effects.

Within each type of action, the proposed action is described. The counterpoint to all of the proposed actions is the no action alternative described above. It should be noted that during the design and planning phase of the different proposals that comprise the Free and Easy 2 project, a host of alternatives are considered. Many of the concerns and issues that initiated alternatives and alternative uses of resources were subsequently resolved during the planning and the alternatives disappeared as the final proposal emerged. Some of the more significant alternatives that were considered during the planning process but eliminated from the proposal or further evaluation are summarized in Appendix F. Those alternatives carried forward are described in this section.

The proposed action is based on the issues presented in Chapter 1 above and the land allocation objectives from the RMP and NFP. The project design features noted in the next section are a part of the proposed action alternative.

2. Proposed Action: Riparian Reserves

No direct management treatments are proposed within the riparian reserves of Class I - IV streams. Riparian reserve widths are those of the NFP: 150 feet on each side of class 4 streams and 300 feet on fish bearing streams.

In areas proposed for wildlife habitat restoration / enhancement burning (see below), no fire control handlines would be built within the riparian reserves. The prescribed fire would be permitted to creep into the riparian reserves simulating a naturally occurring low intensity ground fire. No active lighting would take place within them.

Any unstable area will be treated as a no treatment riparian reserve. An unstable area is a ground feature that is actively moving or subject to potentially active movement (see page C-31, ROD, Northwest Forest Plan). There are two known unstable areas in units; one in Unit 11-4 and the other in Unit 15-4A.

3. Proposed Action: Upland Vegetation Treatments

The proposed vegetation treatments include young stand management and precommercial thinning, commercial thinning and timber harvesting, noxious weed control, fuel hazard reduction and prescribed fire, and wildlife habitat improvement including meadow restoration. These proposals are summarized in Table B-1 (Appendix B) and further described below.

a. Proposed Action: Young stand treatments and forest development

1) Objectives

Young stand treatment objectives include the following:

- Accelerate the successional trends of the early seral vegetation towards mature conditions,
- Reduce the hazard and risk of a stand replacing fire, and
- Maintain and restore species diversity on both Douglas-fir and pine/oak sites.

2) Description of the proposed treatments

Brushing - The work consists of providing more growing space to selected conifer and/or hardwood trees for enhanced survival and growth. Surplus vegetation (all brush, hardwoods less than 8 “DBH not selected as leave trees, and conifers 6" DBH and less not selected as leave trees) would be cut. Target average spacing for conifer leave trees is 8' x 8' spacing. Hardwood leave trees will spaced at 25' x 25' on all units.

Precommercial Thinning (PCT) - Precommercial thinning consists of cutting or girdling trees and brush to increase moisture, growing space and nutrient availability conifer and hardwood trees selected for retention. All brush would be cut. All sprouting hardwood stems not selected as leave trees and all surplus trees up to 7" DBH would be cut. Vigorous and well-formed conifer leave trees would be retained at a 14' x 14' average spacing (220 TPA). Well formed hardwoods would be retained at either 20' x 20' (110 TPA) or 25' x 25' (70 TPA) spacing depending on the particular

treatment units. For every 5 acres treated, a 1/4 acre no treatment area would be maintained within which no brush, conifers, or hardwoods would be cut.

b. Proposed Action: Older stand treatments

1) Objectives

Treatment objectives include the following:

- Harvest timber to meet BLM's commitment to provide forest resources and commodities, including firewood, to the local and regional economies; and
- Design stand treatments that promote forest health, that capture suppression and mortality, and that reduce the potential for stand replacement fire.
- Design harvest systems that are economically feasible.

2) Description

a) Thinning treatments

Older stands as shown on Table B-1 (Appendix B) would receive a combination of treatments appropriate to each stand (see silvicultural prescription). Prescriptive treatments would include commercial thinning, structural retention cuts, precommercial thinning, or brushing for release. Because of the variable, patch nature of the existing vegetation, silvicultural treatments and thinning prescriptions will vary both between and within stands. Treatment descriptions are as follows:

In stands or portions of *stands with generally a single story*, crown thinning/thinning from below to favor retention of the best trees (conifers and hardwoods) would occur to improve individual tree growth with respect to size, height, crown size/condition, form, and vigor. This treatment would reduce basal area to approximately 90-120 ft^2 /acre on W-S-ESE aspects or to a residual crown spacing of 10-15 feet for non-pine conifers and hardwoods and 20 feet for pine. On WNW-N-E aspects, this treatment would reduce basal area to 100-140 ft^2 / acre or to a residual crown spacing of 5-10 feet for non-pine conifers and hardwoods and 20 feet for pine. Stands where this is the primary silvicultural treatment are indicated on Table B-1 as "CT".

In those stands or portions of a *stand where a variable, older overstory is overtopping younger advance regeneration* which some is capable of and likely to release and grow if competition is reduced or eliminated, the proposed treatment is to remove a portion of the overstory (structural retention) and to precommercially thin the understory. Approximately 16-25 overstory trees/acre would remain after treatment to provide for structural diversity. This residual would include three large poorly formed and/or defective trees per acre, if available, to contribute to the future snag component. Advanced regeneration would be thinned following the harvest to favor the best tree (species, form, crown, condition, vigor, etc) on an average spacing of approximately 18'x18' (134 TPA). Stands identified for a combination of treatments are indicated in Table B-1 with a prescription of CT/SR

b) Snags and CWD retention

The target in all stands would be to retain an average of approximately 2 snags/acre (preferably >16"dbh) as well as three larger diameter snag replacement (legacy) trees/acre as noted above.

In stands identified for a structural retention or regeneration harvest, the standard of an average of 120 linear feet of down logs per acre greater than 16" in diameter and 16' long would be used. Hardwood logs or pieces of logs may account for a percentage of this goal. Long pieces (i.e., tree length) may be segmented for counting purposes. In order to meet this goal trees may be felled and left. These trees would be identified during the marking of the stand.

In stands identified for commercial thinning: On southerly and westerly aspects, the three year post-harvest goal would be 1-3 pieces of Class 1 or 2 down material per acre averaged across a thinning unit. On northerly and easterly aspects, the three year post-harvest goal would be 2-5 pieces of Class 1 or 2 material per acre averaged across the thinning unit. It is expected that these goals would be met post-harvest due to typical slash loadings, breakage, etc. Consequently, the project design on these lands is to accept the post-harvest CWD level and to allow natural forces (*i.e.*, windthrow, snow damage, top breakage, etc.) to provide infusions of trees into CWD decay classes 1 & 2 over time from the population of reserve and snag replacement trees. The resultant CWD would reflect the size and species composition of the original stands.

4. Proposed Action: Fire and Fuel Treatments

a. Objectives

The primary objective is to reduce the fuels created as a result of this project's vegetation treatments and/or to reduce the current hazard that has resulted from nearly 100 years of fire suppression.

b. Description

Fuel hazard reduction consists of understory thinning and fuel removal/reduction treatments such as hand piling and burning, understory burning / underburn or lopping and scattering. No brushing or thinning for fuel hazard reduction is proposed within the riparian reserves. In timber harvest areas, fuels would be treated to reduce the generated slash loadings.

Understory Thinning for fuel hazard reduction will treat conifer and hardwood trees and shrubs. The purpose of the treatment is to reduce the understory vegetation stocking thereby to reducing fuel/fire hazard. Understory leave trees would be spaced to widths ranging from 15' to 20'. Excess trees and shrubs between 1 - 6"DBH would be cut or girdled. Trees greater than 6"DBH and less than 12"DBH would be girdled where stem density is excessive. All trees 12"DBH or greater would be reserved from this treatment.

Hand Piling and Burning of project-generated fuels (Hp/B) is designed to remove approximately 50 - 75% of the fuel between 1 and 6 inches in diameter and greater than 2 feet in length. Fuel outside this size range is left untreated although some smaller fuels are included in the piles to create ignition conditions. Piles are covered with plastic or lumber paper to create a dry ignition point.

Piles are burned in the fall to winter season after one or more inches of precipitation has occurred. This is to reduce the potential for fire spread outside of a pile and to reduce the potential for scorch and mortality to the residual trees and shrubs.

Understory Burning or Underburn (UB) is the application of prescribed fire within areas where residual trees and shrubs are present. The prescribed fire objective is to reduce the fuel hazard from both dead and down woody material and to reduce the amount of "ladder" fuels present. Ladder fuels consist of both live or standing dead vegetation such as shrubs and small trees in the understory and live and dead branches close to ground level on overstory trees. Understory burning is conducted at anytime during the year when fuel and weather conditions will permit the successful achievement of the objectives and those of smoke management. Burning is typically conducted from fall through late spring. Summer or early fall burning is less common but may be done when needed to meet resource objectives and when escape fire risk can be mitigated.

Fire lines will be constructed by hand construction methods. Waterbaring would be used on all fire trails where the slope exceeds 10% to control water runoff and limit potential erosion. Where a unit adjoins a riparian reserve no fire lines would be constructed in riparian reserves.

Ignition would be by hand using tools such as drip torches. No active lighting would take place within riparian reserves.

Lop and Scatter (L&S) is a slash treatment that does not remove fuel. The fuel is cut into smaller pieces and scattered so that it is in contact with the ground surface. This is done to create a fuel bed that would have a slower rate of spread and flame height during a wildfire. The treatment also decreases the time period for decomposition of the woody debris.

5. Proposed Action: Wildlife Habitat restoration / enhancement

a. Objectives

A number of burns are proposed for wildlife habitat restoration and enhancement purposes (See Table B-1, Appendix B). The overall goals of these treatments are: 1) to bring back a wide variety of plant communities to their natural range of conditions, 2) to restore winter range to benefit big game animals such as deer and elk, and 3) to maintain chaparral communities and the species that depend on this community.

b. Description

Units located in four different plant communities would be treated for wildlife habitat enhancement / restoration (See Table B-1, Appendix B). In all instances, no cutting of encroaching trees or brush would take place within the riparian reserve portions of any unit and no fire control handlines would be built within the riparian reserves. Prescribed fire would be allowed to creep into the riparian reserve but no active lighting would not take place within these reserves.

Oak woodland restoration - The objective is to remove encroaching conifers from the oak woodland areas. In T39S,R8W, Sec 15, units 004 and 005, all conifers, except vigorous pine and

large limby open grown Douglas-fir within the oak woodland, would be manually cut / removed by hand or, in some cases by underburning. Such woodlands occur sporadically throughout the units. Trees and brush not meeting the above description would be cut and harvested (where economically viable) or girdled. Portions of the OI units that are not part of the oak woodlands (forested stands) would be treated under the harvest prescription described above. Approximately 30 acres of oak woodlands would be treated. (*Note:* No activities would occur in the white oak areas within Riparian Reserves).

Meadow restoration - The objective is to reinvigorate the meadow by reducing thatched grass and eliminating encroaching conifers. In units T39S,R8W, Sec. 15 (004) and Sec 23 (010 - portion of 23-4) approximately 20 acres of natural meadow would be burned to remove grass thatch, woody plant material and encroaching brush and conifers. Burning would most likely be done during the winter or early spring when conditions allow for a cool, controlled burn. The meadow would be burned by the use of drip torches, heli-torch, or other similar lighting devices. A small temporary fire trail may need to be constructed on the edge of the meadows to form control points. Fire line construction would be done with hand tools such as shovels, axes and pulaskis. *Serpentine Meadow Restorations* are treatments that are designed to reduce both live and dead fuel, lowering the fuel hazard and increasing the value of vegetation conditions for a wildlife habitat. The treatment might include limited amount of thinning vegetation less then 6"DBH to spacing between 15 and 30 feet; hand piling and burning of fuels, and broadcast burning. In those areas of serpentine meadow habitat restoration burns, no cutting of encroaching trees would take place with the riparian reserves. No handlines would be built within the riparian reserves, allowing the prescribed burning to creep into the riparian reserve, however no active lighting would take place within these reserves.

Jeffrey Pine savannah restoration -- The objective is to maintain and restore Jeffrey pine savannah by reducing the encroachment of Douglas-fir and other fire intolerant species. In unit T39S,R8W, Sec 23 (008 - portion of 23-4), approximately 64 acres of Jeffrey Pine savannah would be underburned. The burn would done when conditions allow for a cool, controlled burn most likely be during the winter or early spring. Ignition would be done using hand lighting devices such as drip torches or other similar lighting devices. A small temporary fire trail may need to be constructed on the edge of the savannah to form a control point. Fire trail construction would be done with hand tools such as shovels, axes, and pulaskis.

Chaparral community restoration -- The objective is to reinvigorate selected chaparral areas, areas that have largely become senescent. In T39S,R8W, Section 23 (003 - portion of 23-4) prescribed fire would be used to burn a mosaic of chaparral, grassland, oak stands to maintain a variety of habitat, particularly the chaparral community. Approximately 80 acres of the 135 acres in this unit would be burned. The burn would most likely be done during the winter or early spring when conditions allow for a cool burn. Ignition would be done using hand lighting devices such as drip torches. Small temporary fire trails along the perimeter would be constructed as needed to form points of control. Fire trail construction would be done using hand construction methods.

6. Proposed Action: Roads / Transportation

a. Objectives

Minimize permanent road construction and rely on temporary spurs where possible and suitable for the long term. Decommission temporary spurs after use. Decommission other roads consistent with TMOs and upgrade drainage where appropriate for the long term objective of a road.

b. Description of the Proposed Action

The proposed road work (construction, maintenance, decommissioning, etc.) is outlined in Table C-1 (Appendix C). The table lists the roads that would be used, constructed, improved, renovated, and/or decommissioned as a part of this proposed project. Construction, improvement, and renovation work would primarily be in concert with commercial harvest and vegetation treatment actions.

All natural surface "spurs" constructed or used for timber harvest or fuels treatments would be blocked or decommissioned upon completion of those treatments.

If available, a mixture of native perennial grasses, annual grasses and legumes would be used where erosion control is needed.

Drainage ditches would be cleaned of debris allowing an unobstructed flow and avoiding disturbance of vegetation (e.g., grasses) that are helping to stabilize the ditch line.

All roadside brushing would be performed either (a) mechanically with self powered, self propelled equipment designed to cut brush and/or (b) manually with hand tools, including chain saws.

D. Project Design Features

Project design features (PDFs) are included in the proposed action for the purpose of reducing anticipated adverse environmental impacts which might stem from the implementation of the proposal.

1. Logging Systems

a. Tractor Logging

To reduce the extent of ground disturbance and soil compaction, yarding tractors would be limited to the smallest size necessary to do the overall job. Tractors would be equipped with integral arches to obtain one end log suspension during skidding of the logs. Tractors would be restricted to approved skid trails. Tractor logging would be restricted to slopes generally less than 35% or where more then 35% occurs in short pitches. In general, trees would be limbed and bucked to 40' maximum log lengths to avoid unnecessary damage to leave trees. Tractor-type logging equipment would not be authorized when soil moisture content exceeds 25 % by weight as determined by a Speedy Moisture Meter at a six-inch depth, except Units 14-4, 23-2, 23-3, and 23-6 where the depth

is eight to ten inches due to heavy textured subsoils that are serpentine influenced.

Skid roads would be water barred in a manner appropriate to the slope and soil type. Main tractor skid trails would be blocked where they intersect haul roads.

b. Cable Yarding

In cable yarding units, step landings would be permitted only if all other options are infeasible. Cable yarding corridors would be waterbarred when needed and at a spacing appropriate for the slope and soil type. In general, trees would be limbed and bucked to 40' maximum log lengths to avoid unnecessary damage to leave trees.

c. Helicopter Yarding

Helicopter operations will be restricted to the hours of 7 AM to 5 PM, Monday through Saturday. Sunday work would be prohibited. Map 2, pages 1 thru 8 (Appendix A) indicate the location of potential helicopter landing sites.

Harvested trees would be limbed in the units prior to yarding. This is designed to reduce the extent of damage to the residual stand. Some limited whole-tree yarding may take place if required for safety.

Natural surface helicopter landings constructed on BLM land during the logging operation would be ripped, seeded with an erosion control grass and legume mixture, and straw mulched upon completion of landing use and before the onset of the rainy season. Landings used but located on private land would be ripped upon completion of use if requested by the landowner.

2. Seasonal Operation Restrictions

Table 1 outlines the seasonal operating restrictions that would apply:

Table 1: Seasonal Operating Restrictions

Location	Restricted Activities	Restricted Dates	Reasons / Comments
Entire project area	*All road construction, logging and log hauling operations*	*October 15 to May 15 of following year*	*Erosion Control. Some variations of the dates depending on weather and soil moisture conditions.*
1/4 mile radius around an active spotted owl nest site.	*All timber harvest activities (felling and yarding), chainsaw operation and prescribed burning*	*March 1 to June 15 (for disturbance). March 1 to Sept. 30 (for habitat removal)*	*Dates and restriction dependent on nesting status. (Rogue River/South Coast Biological Assessment, Aug. 1996)*
1/4 mile radius around any raptor nest	*All timber harvest activities (felling and yarding), chainsaw operation and prescribed fire.*	*Variable depending on species.*	*(BLM Instruction Memo OR-96-78).*

**Some variations in these dates would be permitted dependent upon weather and soil moisture conditions.

3. Fire and Fuels Management & Fuel Hazard Reduction Treatments

Proposed treatment review - All proposed vegetation treatment units would be re-evaluated following logging or other treatment to insure that the slash/fuel treatments are appropriate for the post harvest/treatment condition. The fuel treatments noted in Table 1 reflect the current expectation of fuel treatment needs. Treatments would be changed if it appears that something different would better accomplish fuel treatment and/or site preparation needs while reducing the potential adverse impacts on air quality and site productivity would be recommended.

Smoke management - Prescribed burning would be managed in a manner consistent with the requirements of the Oregon Department of Forestry's Smoke Management Plan and the Department of Environmental Quality's Air Quality and Visibility Protection Program. Additional measures to reduce the potential level of smoke emissions would include mop-up to be completed as soon as practical after the fire, burning with lower fuel moisture in the smaller fuels to facilitate their quick and complete combustion, burning with higher fuel moisture in the larger fuels to minimize consumption and burn out time of those fuels, and covering handpiles to permit burning during the rainy season where there is a stronger possibility of atmospheric mixing and smoke dispersal.

Prescribed fire plans - Prescribed Fire Plans will be prepared that include both resource and fire objectives. Acceptable fuel moisture and weather parameters are developed based on these objectives. The timing of the burn is based on achieving these objectives, occurrence of the parameters, predicted weather, and the availability of adequate fire suppression resources as a contingency plan in the event of fire escape. The plans include design features to diminish any potential of fire escape from control lines such as: appropriate prescribed weather and fuel moisture conditions that will produce fire behavior which can be readily controlled by direct attack; specified numbers of people and equipment required for the burn; and escape contingency requirements such as the availability of backup forces, both locally and regionally. These features would be in place before burning is permitted to occur.

The Prescribed Fire Plan includes acceptable mortality levels as prescribed fire effects can include mortality in both the overstory and understory vegetation. These levels typically limit overstory mortality to 10-15% or less, and understory mortality to 20-50% or less depending on resource objectives. For example, when prescribed fire is used to "thin-out" understory vegetation (as opposed to thinning with chainsaws) the higher acceptable percentages of mortality would apply. Or, an underburn treatment prescription could range from burning 30% of the area (a "mosaic" burn) to up to 90% of the area.

Stands *may* be treated once, or depending on initial results, may be treated by fire in subsequent seasons to gradually move a stand towards the desired conditions. All areas planned for prescribed fire treatments that contain sensitive plant species would be burned under the weather and fuel conditions and/or season that minimizes impacts on plant reproduction and active growth.

Patrol and Mop-up of burned areas would occur to prevent areas from reburning and becoming escape fires. A helicopter with water bucket may be used during mop-up to aid in extinguishing larger burning fuels and internal reburning in islands of unburned fuels.

Time Line and Accomplishment - The fuel treatment acreage estimates in Table 1 represent the estimated maximum amount of acres that would be treated for fuel reductions. Funding and appropriate burning conditions are factors that determine the time line for completion. Hand piling and burning are anticipated to occur the first season after harvesting or vegetation treatment. Broadcast burning could occur over a period of several years. All fuel treatments associated with timber harvest are expected to occur. The actual treatment method that is used would be selected based on post-harvest conditions and appropriate physical, biological, and social features of each specific site. If prescribed burning is not used on a harvest area then lop and scattering of slash would occur.

Treatments associated with precommercial thinning, wildlife habitat, and fuel hazard reduction would occur based on funding and priority. Factors that influence priority include distribution and need for habitat development, biological and social constraints, and strategic hazard reduction needs for wildfire protection. It is anticipated that 80% or less of the acreage proposed for burning would actually receive the fuel treatment. Precommercial and understory thinnings that do not have prescribed burning treatments would have lop and scattering of slash. The accomplishment of treatments would be expected to take place within the years of 2000 to 2005 or later.

Mollusc / Salamander Protection - Areas with rock outcrops or talus will be buffered from any broadcast burn to avoid potential impacts to Survey and Manage molluscs and salamanders. Buffer size and shape will be site specific.

4. Roads - Construction, Improvement, Decommissioning, Closures

All new road construction and improvement would be done to the minimum standard appropriate to the intended long term use of the road. Roads would be closed and / or decommissioning where appropriate to reduce the potential for erosion and to reduce the impacts on wildlife and consistent with the TMOs. Roads proposed for decommissioning that are needed to support the prescribed burning / fuel reductions would have the decommissioning scheduled for after burning is complete.

Dust Abatement - Dust created from log hauling traffic would be abated in order to reduce driving hazards and protect the fine surfacing materials which bind the road surface rock thus increasing its longevity. Dust abatement may be in the form of water or lignin, or reduced hauling speeds.

5. Stream and Riparian Habitat Protection

Riparian reserve widths would conform with the Standards and Guidelines in the NFP (p. C-30) and the RMP: Fish bearing streams - 300 feet slope distance or 2 site-potential tree heights on each side; permanently flowing non-fish bearing - 150 feet slope distance or one site-potential tree heights on each side; intermittent streams - 100 feet slope distance or one-site potential tree height on each side. Also, areas of potential instability would receive a 150 foot no-harvest buffer (e.g., Unit 11-4).

6. Wildlife Trees and Dead and Down Material

All snags greater than 10" DBH would be reserved from cutting and removal in all units, unless they pose a safety hazard. If a snag is felled in the course of operation it will remain in on-site. As a part

of the residual overstory, three large poorly formed and/or defective trees per acre would be marked as green wildlife tree to contribute to the future snag component. If a designated snag wildlife tree needs to be cut due to worker safety concerns, the tree would be left in the unit. All pre-existing down woody material would be retained on in timber harvest areas.

7. Botanical Resource Protection

If any Survey and Manage Component 1 or 2 species are found in any units, a no-harvest, no-ground disturbance protection buffer will be implemented around each population. Actual buffer size will be dependent on microsite conditions required to maintain habitat as required by Northwest Forest Plan Management Recommendations. No slashing and burning would take place within these buffers.

If federal or state listed, candidate or Bureau Sensitive species are found, a minimum 100-foot radius no-harvest, no-ground disturbance protection buffer will be required. For other Special Status species, a protection buffer will be decided upon on a case-by-case basis, depending on the species' habitat requirements.

For all protection buffers, trees will be directionally felled away from buffer edges.

Burns in areas containing special status plant species would follow prescriptions that result in "cool" burns which minimize potential damage to plant populations. Prescribed fire operations would be done in manner which strives to reduce or eliminate burning through identified Special Status plant population areas depending on the adaptability of each species to fire.

Burn prescriptions would be such that they ensure low flame lengths in areas with Survey and Manage non-vascular species habitats on tree boles and areas adjacent to late-successional forest habitat. Establish protection buffers around populations at risk from fire projects.

8. Wildlife Resource Protection

Surveys for all suspected Threatened and Endangered species and Survey and Manage species as called for in the ROD, RMP and Endangered Species Act (1973) to established protocol standards would be be completed. If species are located within or adjacent to the sale area, established protection measures would be implemented consistent with the management recommendations for that species.

Del Norte salamander sites would receive a buffer of one site potential tree no harvesting or vegetation treatment buffer. Activities that would directly disrupt the talus layer would be avoided (*e.g*., skid roads or yarding corridors. Precommercial thinning, slashing and prescribed burning would not be implemented within the buffers in order to maintain suitable microclimate for this species. Trees would be directionally felled away from these buffers.

Survey and Manage mollusc sites will be buffered according to accepted standards. Buffer size and strategy will be species and site specific. Activities that would directly disrupt the talus layer would be avoided, such as skid roads or yarding corridors. Precommercial thinning, slashing and

prescribed burning would not be implemented within the buffers in order to maintain suitable microclimate for these species. Trees would be directionally felled away from these buffers.

Natural meadows and grasslands greater then 1 acre in size will receive a one potential site class tree no harvest buffer around the perimeter to maintain thermal and hiding cover for big game species.

All mine adits occupied by bats will receive a 250 foot no-harvest, no ground-disturbance protection buffer.

Red tree voles will be managed under the current guidelines (i.e., Version 2.0).

9. Recreation Resources Protection

Along the Limestone Challenge SRP Equestrian Endurance Ride trails in sections 14 Unit (14-6) and 23 (east half of section) trees would be directionally felled away from the trail. Skidding logs across the trail would be avoided to the greatest extent possible. If logs are skidded across the trail the trail tread would be repaired to pre logging activity conditions.

Chapter 3
Environmental Consequences

A. Introduction

Only substantive site specific environmental changes that would result from implementing the proposed action or alternatives are discussed in this chapter. If an ecological component is not discussed, it should be assumed that the resource specialists have considered affects to that component and found the proposed action or alternatives would have minimal or no affects. Similarly, unless addressed specifically, the following were found not to be affected by the proposed action or alternatives: air quality; areas of critical environmental concern (ACEC); cultural or historical resources; Native American religious concerns; prime or unique farmlands; floodplains; endangered, threatened or sensitive plant, animal or fish species; water quality (drinking/ground); wetlands/riparian zones; wild and scenic rivers; and wilderness.

This project is not located within the Oregon State Coastal Management Zone (CMZ). Unless otherwise noted it has been judged not to have any direct affects on the resources within the management zone nor has it been identified by the State of Oregon's LCDC as a project (by type and geographic location) outside of the CMZ but still needing a consistency review. Thus a consistency determination and review by the State of Oregon LCDC is not needed.

General or "typical" effects from projects similar in nature to the proposed action or alternatives are also described in the EISs and plans this EA is tiered to.

Tables 2 and 3 summarize the acreage of different conditions and treatments pertinent to the proposed vegetation treatment alternatives. It is a summarization of some of the comprehensive treatment proposal information of Table B-1 (Appendix B). It provides some of the context for assessing environmental effects of the Free and Easy 2 proposals. The Upper Illinois Landscape Management Project, a joint EIS project between the BLM and the Siskiyou National Forest, situated in both the East and West Forks of the Illinois watersheds, was in the planning stage at the time of the preparation of this environmental analysis. The project alternatives for that project were not sufficiently developed at the time of this writing to include those effects into a cumulative effects analysis in this EA. Free and Easy 2 will be included in the cumulative effects analysis of the Upper Illinois project.

Table 2: Project Area Seral Stage Treatment Effects Summary				
Vegetative Condition	*Current Conditions - BLM Lands (acres)*			*Post- Treatment Alternative 2 (Est. acres)*
	*Kerby Watershed**	*East Fork Illinois Watershed***	*Free and Easy 2 Project Area*	*Free and Easy 2 Project Area*
Grass / forb	9	456	153	153
Shrub dominated	149	112	102	102
Hardwood / woodland	247	31	23	23
Early Seral	70	0	0	0
Seedling / sapling	337	327	0	0
Poles	301	213	25	25
Mid Seral	1,456	1,067	583	583
Mature	608	2,004	705	705
Jeffrey pine	3,022	739	444	444

* source: Kerby Watershed Analysis (adjusted and updated).
** source: East Fork Illinois Watershed Analysis

Table 3: Summary of acres of treatment proposed in each vegetation treatment (from Table B-1, Appendix B)).	
Proposed Treatment	*Alternative 2 Proposed Action (acres)*
Pre-Commercial Thin / Brushing	55
Commercial Thin	112
Structural Retention / Commercial Thin	357
Serpentine/Meadow Restoration burn	234

B. Site Specific Beneficial or Adverse Effects of the Alternatives

1. Resource: Soil / Water

a. Affected Environment

This project is located on several sections of land in two small sixth-field watersheds within the Illinois River/Josephine Creek and East Fork Illinois fifth-field watersheds (WA's). The pertinent sixth field watershed are the Kerby and Lower East Fork Illinois.

Kerby WA - This is the eastern third of the Illinois River/Josephine Creek fifth field WA and encompasses 18,770 acres, about a third of which is BLM land. Within this WA there are 7.9 miles of the Illinois River north of the confluence of the East and West Forks of the Illinois River. Major tributaries are Free and Easy Creek, Reeves Creek, and Holton Creek. Average annual rainfall ranges from 58" in the valley to 74" in the far southwest corner mountain slopes. Soils in the project area include serpentine influenced Cornutt and Dubakella (very) cobbly clay loams; highly serpentine Eightlar extremely stony clay, Pearsoll extremely stony clay loam; and soils developed from weathered metamorphic rock, Speaker (20 - 40" effective depth) and Josephine (40 - 60" effective depth) gravelly loams.

Lower East Fork Illinois WA - This is the north third of the East Fork Illinois fifth field WA and

encompasses 30,823 acres, about 16% of which is BLM land. Within this WA there are 14.5 miles of the East Fork of the Illinois River to the confluence of East and West Forks. Major tributaries include Chapman, Tycer, Sucker, Althouse, and Elder Creeks. Sucker and Althouse Creeks are separate fifth watersheds. Average annual precipitation is 64" in the valley to about 100" on mountain slopes at the southeast end of the WA. Soils in the project area include Brockman clay loam, a heavily serpentine influenced soil with a clay subsoil (7 to 12 % slope) in addition to the soils listed for Kerby WA.

The Illinois and East Fork Illinois River flood plains, within the project area, vary in width from roughly 10 to 20 times the bankfull width of the streams. Highest elevation is slightly greater than 5,100 feet on Page Mountain. The lowest elevation is roughly 1,100 feet on the Illinois River. Main streams meander in the valley bottoms with class 1 to 4 tributaries that flow out of their stream valleys or off the ridge slopes. The Free and Easy 2 project is located at low elevations and is outside of the Transient Snow Zone or high elevation snow dominated areas.

The Illinois and East Illinois Rivers within the above 6th field WA's are currently listed as Water Quality Limited (Ref. 1998 Oregon Section 303(d) List) due to flow modification (affects on Coho salmon) and warm summer temperature (moving 7 day average of daily maximums > 64/ F). No other streams are currently on the 303(d) list.

b. Environmental Effects

1) Short and Long Term

The following table provides ratings for local effects of the alternatives as compared to the current condition.

Table 4: Hydrologic Effects

6th Field WS	Term	Type of Effect	No Action Alt. 1	Alt. 2
Kerby	Short (1-5 yrs)	Disturbance / Erosion	0	Min.-
		Added Compaction	0	Min.-
		Productivity	0	Min.-
		Sedimentation from main skid/ haul roads & landings	0	Min.-
	Long (5-20 yrs)	Disturbance / Erosion	Min.-*	0
		Compaction	Min.-*	Min.-
		Productivity	Min.-*	Min.-
		Sedimentation from main skid/ haul roads & landings	Min.-*	0

6th Field WS	Term	Type of Effect	No Action Alt. 1	Alt. 2
Lower E. Fk. Illinois	Short (1-5 yrs)	Disturbance / Erosion	0	Slight.-
		Added Compaction	0	Slight-
		Productivity	0	Min.-
		Sedimentation from main skid/haul roads & landings	0	Slight-
	Long (5-20 yrs)	Disturbance / Erosion	Min.-*	Min.-
		Compaction	Min.-*	Min.-
		Productivity	Min.-*	Min.-
		Sedimentation from main skid/haul roads & landings	Min.-*	Min.-

Footnotes:

Effects ratings - (-) = negative effect; (+) = positive effect; (0) = neutral effect

Min. = minimal; very little, limited to few sites; Slight = little distributed over most affected area; Moderate = mid level;

* Assumes high fire hazard and risk for no action alternative.

There are two concerns, one is added compaction due to additional skid in existing tractor yarded units the other is logging on fine textured serpentine influenced soils (Cornutt-Dubakella, and Brockman):

1. As proposed, tractor yarding may take place in some units that were tractor yarded in the past. In such situations, even with designated skid trails, as proposed, the areal extent of compaction, within a unit, could become above the high level of 12%. This would reduce soil productivity below rates used in the RMP planning process and areas of reduced infiltration, causing increased surface water runoff by approximately 5 % during periods of saturation. However, this situation may be rare for the units proposed for harvest. Therefore, monitoring will be conducted to determine extent of compaction in this situation, see Appendix E.

2. Serpentine influenced soils have heavy textured subsoils that are susceptible to compaction due to elevated moisture levels and, after disturbance, infiltration is reduced which causes higher erosion susceptibility. Generally these soils do not recover from disturbance as quickly as other soils. Serpentine influenced soils are located in units 14-4, 23-2, 23-3, and a small amount of 23-6. These units are proposed for timber harvest. In order to minimize the effects, these units will have soil moisture levels checked at 8 to 10 inches in depth where subsoil moisture is likely to accumulate and no logging equipment would be authorized when moisture content exceeds 25%, see Project Design Feature 1 a).

Overall, there would be minimum to slight negative short term impact for alternative 2 but long term impact would be at or less the impact level of the no action alternative, due to the probability of fire in the project area with related effects occurring in the long term.

c. Cumulative Effects

Three indicators are used to reflect the existing conditions (cumulative effects of past activities on watershed conditions). The condition of each of these with additional effects of this project are estimated (based on past analysis, map and aerial photo interpretation) and listed below:

Table 5: Watershed Conditions (at HUC 6 scale)				
HUC 6	% Early Seral	% Compaction	Road Density (mi/sec)	Comments
Kerby (Est.) - current - % Add: Alt 2	Mod (6-18) <1	Mod (6-12) <1	High (>4) 0	84% Non-BLM land (81% USFS)
L.E. Fk. Illinois River - current - % Add: Alt 2	Mod (6-18) <1	Mod (6-12) <1	High (>4) 0	50% Non-BLM land Road density is high

The three headings above are indicators of correlative hydrologic responses:

1) Percent early seral represents the areal extent of early seral vegetation on forest land. The estimate is at moderate levels for both watersheds. The hydrologic response to high amounts of early seral vegetation is increased stream yield due to reduction of evapotranspiration rates.

2) Percent compaction represents the areal extent of compaction. The above estimate is considered to be at high levels. The hydrologic response of extensive compaction is an increased surface flow due to decreased infiltration rates. It also affects productivity as root growth rates are reduced as subsoil density increases.

3) High road density (4+ miles of road per square mile, or section, of land) correlates to an increase in mid peak stream flows and slight reduction in low stream flows due to interruption of shallow ground water and routing of flow off the roads to streams by way of the natural drainage system.

Under the proposed action (Alternative 2) there would be no additions of road density. Extent of compaction and early seral vegetation would remain at moderate levels. At both the 5th and 6th field watershed levels, implementation of this project would not result in any significant increases of cumulative effects or bring existing cumulative effects up to high levels.

2. Resource: Vegetation and Silviculture

a. Affected Environment

Current trends of vegetation in the project area include: increasing densities of trees and shrubs within stands and a shift from historically dominant species to species that were historically a lesser component of the landscape or found primarily in the understory. Pine species (Ponderosa, Jeffrey, and sugar) and intolerant hardwoods (including black oak, madrone, and white oak) were more prevalent. Historically, Douglas-fir was less common than it is today.

The existing vegetation conditions in the watersheds are a result of fire suppression and replacing the natural disturbance pattern with human disturbances such as logging (particularly of the high value pine species), mining, farming, and rural development. Fire suppression has resulted in many of the forests in the watershed reaching densities of trees and shrubs that are not sustainable over time. Vegetative response to past light intensity fires was development of more open forests with fewer

but larger trees. In addition, fire suppression has contributed to Douglas-fir now occupying what formerly were Ponderosa pine and white oak sites. Past harvest patterns in the watershed have resulted in removal of economically and biologically valuable tree species such as Ponderosa and sugar pine.

Total tree densities in the project area run as high as 700 stems per acre. These types of forests are prone to stand replacement fires. Nitrogen losses are roughly equivalent to the amount of duff (organic matter) consumed. Burns of lower intensities that retain organic matter and large wood benefit long term site productivity. Fire is the primary process that lowers densities and clears out competing understory vegetation. In the absence of fire, insects and disease become the processes that reduce stand density. However, stand densities in the project area, the build up of dead and down fuels, the checkerboard ownership of private and government lands, and the rural residential interface, preclude the reliance on the natural fire regime to control forest densities.

Past timber harvest patterns in the watershed have tended to simplify forest structures while increased fire suppression has driven forest structure towards a higher level of complexity. This has occurred on many sites where it is not sustainable such as those areas that historically supported the Ponderosa pine and white oak series.

While the discussion here is about tree species, a similar change in species composition of both the shrub and herbaceous layer is also occurring.

b. Environmental Effects

1) Alternative 1: No Action

a) Short Term

The above-mentioned trends in the stand trajectories such as reduction of pine species and shade intolerant hardwoods, and an overall shift in species composition to those which have a competitive advantage with the absence of fire and increasing stand densities will continue. The high potential for large scale stand replacement fire and subsequent loss of site productivity will remain. The scale could be in the hundreds of acres.

Increasing density and cover of scotch broom and star thistle can be expected.

b) Long Term

Trends mentioned above under affected environment and no action/short term are expected to continue and amplify.

2) Alternative 2: Proposed Action

a) Short Term

Overall tree densities will be reduced, allowing site resources to be made available to fewer, larger,

more vigorous trees, both hardwood and conifer. Fire will be re-introduced into an ecosystem where it has been absent or reduced. Fuel hazard will be diminished.

Stand successional and development trajectories will shift to where pine and hardwood species will be given a competitive advantage. Some selection pressure on plant species composition of future forests will occur.

Commodities will be produced to provide raw materials and jobs to the local communities.

b) Long Term

Under the proposed action, stand densities will be reduced, surplus vegetation will be cut, and the resulting fuel will be burned. This will allow for more rapid diameter increase (radial growth) in residual trees (conifers and hardwoods). The resulting stands will have a greater chance of surviving a subsequent fire event.

c) Cumulative Effects

At the present time, a wild fire would have a high potential to be an intense stand replacement fire and threaten human lives and property. The proposed blend of vegetation management techniques and prescribed fire seeks to mimic the natural disturbance regime of frequent low intensity fire. This will serve to maintain the structural and species composition and distribution more within its historic range of conditions.

3. Resource: Fisheries

a. Affected Environment

Fall chinook salmon, coho salmon, winter steelhead, resident rainbow trout, cutthroat trout, Pacific lamprey, and other native and exotic fish use the mainstem Illinois River and East Fork Illinois for spawning, rearing, or migration. Coho salmon are currently designated as a threatened species under the Endangered Species Act. Chinook salmon are currently a proposed federally threatened species. Steelhead are a federal candidate species.

The Oregon Department of Fish and Wildlife (ODFW) has identified fish habitat benchmarks. These benchmarks are useful to determine if a component of fish habitat is a factor limiting trout or salmon production or survival. Large woody debris levels, pool depth and frequency, and water flow and temperature have been identified as limiting factors for salmon and trout production and survival in streams in the project area.

The Illinois and East Fork Illinois Rivers within the two HUC-6 sub-watersheds containing the project area are currently listed as Water Quality Limited (1998 Oregon Section 303(d) List) due to flow modification and warm summer temperatures. Free and Easy Creek is also 303(d) listed for warm summer temperature. No other streams in the two affected 6th field sub-watersheds are currently on the 303(d) list.

Within the project area, no stream temperature data have been recorded. Site visits indicate that Chapman Creek is a cool water stream with an adequate riparian reserve to maintain cutthroat trout survival and production. Other streams in the project area have heavy irrigation withdrawals and warm water and are not conducive for salmonid survival and production.

Chapman Creek is a perennial Class 1 stream. Winter steelhead and cutthroat trout are present in Chapman Creek 1.0 miles and 2.5 miles upstream of the mouth, respectively. Steelhead are present approximately 0.5 miles downstream of proposed silvicultural treatments in Section 25. Cutthroat are present in portions of Chapman Creek which are adjacent to treatment units in Section 23. The east fork of Chapman Creek does not support fish. The presence of mayflies and caddisflies in Chapman Creek indicates good water quality. Spawning gravel in Chapman Creek is naturally limited with 50% embeddedness and 10% sand.

Tycer Creek is a Class 1 stream which is perennial in the lower reach and intermittent in the upper reach due to irrigation withdrawals. Cutthroat trout and winter steelhead are present upstream from the mouth approximately 3.0 miles. Habitat for these two species exists approximately 0.5 miles downstream of units in Section 25 which are proposed for treatment. Tycer Creek has limited spawning substrate, and is sand-dominated with very few fish present.

Reeves Creek is a perennial Class 1 stream which is diverted into an irrigation ditch before reaching the area adjacent to the proposed treatment unit in Section 33. As early as March, a gravel push-up dam which diverts all flows for irrigation is constructed in Reeves Creek . Flows and fish passage may not become re-established until the fall. Upstream of BLM ownership, Reeves Creek supports salmonids. Coho salmon and winter steelhead are present as far upstream of the mouth as 2.0 miles, and cutthroat trout are present to 3.7 miles upstream. During the season of diversion, salmonids are present in the Illinois River, which is approximately 1.0 mile downstream. During the winter, salmonids are present in Reeves Creek, which is as close as 0.25 miles downstream of the proposed unit. No silvicultural treatment will occur during the winter, however.

Holton Creek is intermittent yet supports winter steelhead and cutthroat trout upstream 1.0 and 1.5 miles, respectively. Cutthroat may be present as close as 0.5 miles downstream of treatment units in Section 15, and as close as 1.5 miles downstream of units in Section 11; steelhead may be present further downstream. Fish habitat is in poor condition due to past watershed and agricultural practices.

George Creek and tributaries and Mill Creek are intermittent with no fish presence. These streams flow through or have tributaries in units proposed for treatment in Sections 15 and 23. Salmonids are present approximately 2.0 miles downstream of these units. These streams have warm water pools and are sand-dominated. Mill Creek has a road failure in the uplands contributing sand to the streams. Road 39-8-23 is privately owned and drains to the stream through large ruts in the road. The riparian reserves are mostly on flat floodplain terraces with deciduous trees.

Tributaries to the Illinois River in Section 17 are intermittent and do not support fish. They flow into the Westside Ditch, which is screened. Salmonids are present approximately 2.0 miles downstream in the Illinois River.

b. Environmental Consequences

1) Alternative 1 - No Action

a) Short Term (0 - 5 years)

Road slumps, failures, and fords would continue to occur and exist. Sediment in the spawning gravels would continue to increase and would limit salmon and trout production. Coho salmon, steelhead and resident trout populations would decrease. Road 39-8-23 in section 23 will continue to contribute sediment to Mill Creek and its tributaries by intercepting flows and eroding via inadequate crossings and unmaintained drainage. Low levels of instream large woody debris will continue to limit trout and salmon populations throughout the project area. Summer water temperatures will remain a limiting factor as well.

b) Long Term (> 5 years)

As the seral stages continue to advance in the riparian reserve, the canopy closure would increase and summer stream temperatures would slowly decrease. The size and amount of wood added to the streams would increase. This would increase pool frequency and depth, and provide rearing habitat for juvenile salmonids and adult holding areas. Additionally, the large wood would hold back additional spawning gravels and diffuse energy during high flood events, thereby reducing stream scour. As old skid roads grow over and slowly become less compacted, infiltration would increase and the runoff from these roads would have less of a negative impact on flashy flows and stream sediment levels. Some roads may not revegetate, however, due to continuous OHV use. Road 39-8-23 would probably continue to erode for decades before stabilizing. Trout and salmon production rates would remain constant. Correspondingly, trout and salmon populations would remain fairly constant, ignoring limiting factors outside of the watershed which affect survival.

2) Alternative 2: Proposed Action

a) Short Term (0 - 5 years)

A small amount of additional sediment would result from the temporary placement of a culvert in Reeves Creek. However, it should not result in any decline of fish survival or production. This temporary culvert will be installed and removed during the same dry season and at a time when the stream is dry and there are no fish present. While Reeves Creek is fish-bearing, it is dry during part of the year due to total diversion for irrigation upstream. This is the period when the culvert will be temporarily installed and used. No adverse effects to fish would occur from this action.

A small amount of sediment input to intermittent Mill Creek may result from the placement of culverts and grading during renovation of road 39-8-23. The sediment input from the road renovation would be negligible and indistinguishable from background levels, and no adverse effects to fish are anticipated from the action. Renovation and gating of road 39-8-23 will have the immediate beneficial effects of reducing sediment input and returning flow to Mill Creek.

No silvicultural treatments or fuel reduction treatments are proposed within riparian reserves. In

areas of serpentine meadow habitat restoration burns, no cutting of encroaching trees would take place within the riparian reserves. No handlines would be built and no active burning will take place within the riparian reserves. The prescribed burning, however, could be allowed to creep into the riparian reserve (Class I-IV streams) during the burning of adjacent units. This would create a mosaic of low intensity burned and unburned conditions. No adverse effects upon aquatic habitats are anticipated from these proposed actions.

b) Long Term (> 5 years)

There are no negative long term effects anticipated from the actions proposed. Any of the underburning proposed for outside the riparian reserves may have the beneficial long term effect of creating a mosaic of vegetation on the edges of the reserve, but it will probably not have an effect on aquatic resources. The renovation and gating of road 39-8-23 will have the long term beneficial effect of reducing sediment input and returning flow to Mill Creek. The road currently intercepts slope and stream flow, routing it down the road and transporting road material into Mill Creek.

c) Cumulative

The cumulative effects of a proposed action are considered on the fifth field watershed level and should include known actions on both public and private land. Private land activities are especially important in the Kerby Watershed, as only 44% of the land ownership is public. The Kerby Watershed Analysis identified a substantial decrease in fish populations from historical levels due to the cumulative impacts of irrigation diversions, mining, timber harvesting, and road construction. Federally and state funded programs currently promote riparian restoration on private land in the project area through alternatives to irrigation withdrawal, stream buffer revegetation, improved grazing practices, and more stringent State Forest Practice Rules.

The proposed action will not contribute to observable cumulative effects at the watershed or 5th field level.

4. Resource: Botany

a. Affected Environment

The relatively dry forested areas of this project do not provide a large amount of habitat for Survey and Manage vascular plants. Moister communities, where the potential for Survey and Manage species is highest, are confined to northerly aspects and drainages. Serpentine-influenced grasslands did provide for a higher diversity of plant species within the project area, however. Special Status serpentine species were found in dry and wet areas. Results of the vascular and non-vascular plant surveys completed to date are described below.

1) Survey and Manage Vascular Plants

Two populations of *Cypripedium fasciculatum* have been located in T39S-R8W-Sec. 23 and in T39S-R8W-Sec. 25. This orchid species is very long-lived; perhaps as long as 95 years (Management. Recommendations 1998). It can take up to 15 years to emerge above ground and

requires specific mycorrhiza for germination and establishment. *C. fasciculatum* occupies a range from central Washington to northern California with some scattered populations in the Rocky Mountains. The species sparsely covers this range and is currently considered threatened or sensitive in most states. It is a Bureau Sensitive species under BLM policy and a Species of Concern under the Federal Endangered Species Act, besides being a Survey and Manage (Strategy 1 and 2) species.

The Management Recommendations for Vascular Plants (1998) state for this species that: 1) habitat conditions be maintained or restored in population areas, 2) canopy closure be maintained at 60% or greater, 3) down logs, snags and duff layer be maintained for soil moisture and mycorrhizal associates, 4) activities that alter soil, duff, downed wood and mychorrhiza be avoided, 5) known sites be secured from prescribed fire, except in research areas, 6) population areas be large enough to maintain microclimate, 7) biological/ecological requirements at each life stage be managed and 8) environmental change be managed in such a way as to ensure evolutionary potential.

2) Special Status Plants

Two populations of *Limnanthes gracilis var. gracilis* have been located in T39S-R8W-Sec. 15 and T39S-R8W-Sec. 23. As this species is considered a Bureau Sensitive species, it will get the same protection as a Federal Candidate species in order to ensure the species will not need to be listed. The species occurs in wet, grassy openings and meadows in native moist grasslands in both the Rogue and Illinois Valleys. Much of the habitat for this species has been diminished by development, agricultural practices and off road vehicle impacts. The BLM lands in the vicinity of this project offer some of the last protected habitat for this species.

Within the serpentine savannahs in the project area can be found *Senecio hesperius*, *Calochortus howellii* and *Microseris howellii*. These are serpentine endemics and are Bureau Sensitive species. They compete with other grassland species and are scattered sparsely through most of their habitat in the Illinois Valley. Some prescribed burning has been completed for these species on Forest Service land nearby. Although it is too soon for final conclusions to be drawn, preliminary results show that the species react positively to burning in their habitat.

One population of a wetlands serpentine endemic species, *Epilobium oreganum,* has been found in T39S-R8W-Sec. 23. This Bureau Sensitive species is usually found in association with *Darlingtonia californica* fens, but has been found occasionally in wet areas without this species present (as in this case). Only twelve other populations of this species have been found in the Grants Pass Resource Area. Its habitat is limited making it one of the more sensitive species for protection.

One small population of *Erythronium howellii* has been located in T39S-R8W-Sec. 23. This Bureau Sensitive species has a very narrow range within the Illinois Valley and a small portion of Del Norte County. It is an edge species that is tied to serpentine forests adjacent to meadow openings. Recent surveys in other project areas have found many previously unreported populations of the species. This population site remains one of the few this far north in the valley.

Several Bureau Watch species have been found in the project area: *Cypripedium californicum, Mimulus kellogii* and *Perideridia howellii*. These species do not currently require any specific protection or management. Population locations are tracked because they are relatively rare and could become threatened in the future.

3) Non-vascular plants

Fungi surveys have not been completed for this project as yet but are scheduled for fall 2000 and spring 2001. Approximately 95% of the lichen and bryophyte surveys have been completed (a portion of Section 23 has not been surveyed at the time). The only populations found were in Section 15. The Survey and Manage Category 1 species *Lobaria hallii* and *Bryoria tortuosa* were both found.

The *Bryoria tortuosa* specimen was collected from the ground in Unit 15 - 4. Its host plant has not been determined however it is a species that tends to be found on oaks and pines with some mature trees present. This is a Category 1 species. Thus, all known sites of it must be managed. Management recommendations call for maintaining an area large enough to ensure quality ecological conditions including undisturbed forest structure, substrate and associated microclimate. Recommendations state that harvesting of trees, shrubs or other vegetation should be avoided except where vegetation may be impairing habitat. Since the species prefers mature, open grown trees some brushing and prescribed fire would probably be beneficial to maintain such habitat in dense understory.

Proposed Mitigating Measure #1: Re-survey unit 15-4 (004) to locate the population of *Bryoria tortuosa* and establish appropriate buffers.

b. Environmental Effects

1) Alternative 1: No Action

The effects of the No Action alternative on Special Status or Survey and Manage species would be both positive and negative. This alternative will allow the current ecosystem structure and functions to continue on its current condition and trajectory.

Potential adverse effects on special status or Survey and Manage species stem from the current trend of increasing wildfire risk and potential fire intensity. This would threaten *Cypripedium* populations which have been shown not to survive such fires (Management Recommendations). Also the current successional trends will result in a long term decline of Special Status serpentine savannah species due to increased grass thatch and habitat deterioration.

As with the vascular Survey and Manage species, the non-vascular species require more moist microsites. The substrate for lichens and bryophytes can be the trees (especially hardwoods) and shrubs within riparian areas. Since Survey and Manage non-vascular species have been located in the project area, potential habitat does exist and could be affected in the form of reduction of substrate for the establishment of new populations. Connectivity of habitat is very important for such species. Retaining standing trees and shrubs within these reserves could maintain suitable

microclimate for the establishment of Survey and Manage species. These trees and shrubs will also act as refugia and will provide the complex canopy structure required to protect species diversity and to act as dispersal centers for riparian-dependent species. Therefore, the effect of removal of pre-commercial sized trees in these riparian areas could reduce the ecological function of these reserves in relation to species diversity, species dispersal and mycorrhizal interactions

2) Alternative 2: Proposed Action

a) Proposed Upland Vegetation Treatments

Short term, direct effects to the *Cypripedium fasciculatum* populations would be mitigated by the implementation of the protection measures in Management Recommendations. Disruption in mycorrhizal connections outside of protection buffers could be detrimental in the long term survival or expansion of these populations, however.

Indirect effects will occur from timber harvesting / stand thinning in potential *Cypripedium* habitat. These effects are compounded because of the fragmented, sparse nature of potential habitat in the project area. Whether the treatment is commercial thinning, group selection or structural retention, the ground disturbance from such activities could be detrimental to any populations that may be dormant presently or to any establishment of new populations from intact habitat. This is because the treatments could disrupt the mycorrhizal connections necessary for survival of these species. They could also disrupt potential dispersal corridors for vascular or non-vascular plants. The Vascular Plant Management Recommendations and Appendix J-2 discuss the importance of maintaining ecosystem structure and function for these species, besides maintaining immediate canopy closure. Depending on the treatments the canopy closure will be reduced to varying points which could change microsites from moist shady conditions to more open, dry conditions.

Ground disturbance could affect the *Erythronium howellii* population by unearthing its bulbs.

b) Proposed Fire and Fuel Treatments / Habitat Restoration Treatment

Enhancement of pine savannahs, oak woodlands and meadows will contribute to increased biodiversity for plant species in areas where tree encroachment or build-up of grass thatch has occurred. Such treatments can reduce competition and encourage less common species to thrive. This will be especially true for *Calochortus howellii*, *Microseris howellii* and *Senecio hesperius* which are species that could benefit from low intensity prescribed fire. Population sizes could be increased after competition is reduced following a fire.

Fire and fuel treatments reduce hazardous fuels levels which could otherwise lead to catastrophic fire and destruction of plant populations and their habitats. The effect of such a fire on special status plants would be greatest in those areas of late-successional forest habitat.

Although fire can be beneficial for some plants and their habitats, if not carefully conducted Survey and Manage non-vascular species habitat such as that found on tree boles or shrubs (e.g., oaks) could be adversely impacted. Prescribed burning could kill such species growing on boles of trees.

Mechanical thinning could also remove species and reduce substrate for dispersal of such species. The effect of fire is unknown on *Epilobium oreganum* (found in serpentine wetlands).

c) Cumulative Effects

Most of the BLM and USFS Matrix land with merchantable timber in East and West Forks Illinois Watersheds is currently included in landscape scale projects being planned. Stand thinning and commercial timber removal is a potential treatment for these area over the next few years. In southwestern Oregon, no official habitat assessment has been done, but of the known *Cypripedium* population sites on BLM land, the majority are being affected by timber projects through canopy thinning, ground disturbance and habitat fragmentation. Of the known populations, the majority are being protected through buffers the effectiveness of which has not be rigorously proven to ensure viability for a specific population. The Late-Successional Reserves may not be provide protection of these species as the majority of populations and potential habitat exists in the lower elevation, mixed evergreen vegetation of the Matrix land allocation.

The reasonable foreseeable future actions that will take place on Matrix lands and on county and private land will include continued timber harvest, understory treatments and clearing of forest land for development. More populations will continue to need buffering as more actions are planned on federal lands. Also, populations on non-federal lands will most likely remain unprotected. The long term effect is a probable decrease in the ability of populations to maintain or to expand from these small islands of undisturbed ground into surrounding altered habitat and a consequent decrease in the chances for persistence of the species in southwestern Oregon.

As for pine savannahs, oak woodlands and meadows, habitat enhancement treatments should increase on BLM lands as more areas are identified under future landscape projects. These efforts should lead to greater botanical diversity and an increase in population vigor for several endemic Special Status species.

**Management recommendations have been based on Appendix J-2, Northwest Forest Plan, Vascular Plant Management Recommendations, the Record of Decision (ROD) Northwest Forest Plan, the Medford District Resource Management Plan, the BLM Manual 6840, Medford District botanist advisement and professional knowledge.

Bibliography:

Castellano, Michael A. and Thomas O'Dell. Management Recommendations for Survey and Manage Fungi. Government Publication. 1997.

Harris, Larry D. The Fragmented Forest, Island Biogeography Theory and the Preservation of Biotic Diversity. The University of Chicago Press, 1984,

Luoma, Daniel L., Joyce L. Eberhart, Michael P. Amaranthus. Biodiversity of Ectomycorrhizal Types from Southwest Oregon. Conservation and Management of Native Plants and Fungi. Native Plant Society of Oregon, Corvallis, Oregon. 1997.

Wells, T.C.E. The Biological Aspects of Rare Plant Conservation - Population Ecology of Terrestrial Orchids. Wiley and Sons Ltd. 1981.

5. Resource: Fire and Fuels

a. Affected Environment

Hazard is defined as the existence of a fuel complex that constitutes a threat of wildfire ignition, unacceptable fire behavior and severity, or suppression difficulty. *Risk* is the source of ignition be it human or lightning.

A fuel hazard and wildfire occurrence risk rating analysis was completed for the Kerby and East Fork Illinois Watersheds, which includes the lands in the Free & Easy 2 proposed project area. The project area includes 683 acres of BLM administered lands.

Wildfire occurrence ***risk*** for all lands in the project area is rated as high overall. The fire risk rating assigned in the watershed analysis was determined during field data collection in the Summer 1994. The current high level of risk is primarily due to human use and historical lightning activity levels within the project area. Risk is difficult to change or influence through land management activity as it is a function of weather events (lightning) and human behavior. Reducing public access can reduce human caused fire and affect risk, but reducing access for fire suppression forces can increase fire size and effects. Human use in the future would be expected to increase but its influence in terms of affecting risk is difficult to determine. Therefore, for the purpose of this analysis, risk is considered not to be affected by future human development nor any activity in this project proposal. It is thus considered unchanged for the 20 year analysis period.

Fuel includes dead and down woody debris and live vegetation. The fuel ***hazard*** it creates is dynamic and changes over time and can be altered through land management activities. The natural process of wildfire occurrence prior to settlement in the 1800's prevented large scale fuels build-up. This fire regime was one of frequent, low-intensity surface fires which prevented excessive understory vegetation development and the build-up of large amounts of dead and down woody debris. With human settlement and the suppression of wildfire, fuels have been allowed to accumulate and dense vegetation has grown unchecked. Fuel hazard will increase over time in the absence of disturbance or land management activities which remove or reduce fuels. Without disturbance, fuel hazard conditions become more uniform and continuous. This increases the potential for large, high severity fire occurrence. Dense, overstocked stands are a contributing factor to large stand replacement fire occurrence due to the closed canopy and ladder fuel presence.

Fire exclusion has produced a decrease in the acreage of meadow and oak woodland. These areas historically were fire dependent and maintained. Encroachment by conifers and shrub species have replaced and altered these habitat areas.

Table 6 shows the current fuel hazard condition rating by acres and percent for all acres of BLM land within assessment area. It projects the change in hazard over time, short term (5-10 years), and long term (10-20 years) for the No Action Alternative 1. It also displays the changes in hazard conditions projected as a result of the proposed actions in Alternative 2 for the short and long term periods.

Table 6: Hazard Rating by Acres and Percent for 683 Acres of BLM Lands Within the Free & Easy 2 Project Area			
CONDITION	HIGH HAZARD	MODERATE HAZARD	LOW HAZARD
CURRENT CONDITION	73 % 498 acres	22 % 147 acres	5% 38 acres
ALT 1: NO ACTION 5-10 YEARS	76 % 518 acres	19% 127 acres	5 % 38 acres
10-20 YEARS	87 % 592 acres	8 % 53 acres	5 % 38 acres
ALT. 2 5-10 YEARS	5 % 34 acres	41 % 278 acres	54 % 371 acres
10-20 YEARS	20 % 136 acres	69 % 473 acres	11 % 74 acres

Projections on future hazard are based on current vegetation conditions and known trends of vegetation development in the plant associations. The trend for the next 20 year period is for increasing vegetation density and/or increasing dead and down fuel accumulation. Future management activity is unknown at this time, but it would affect the hazard so this assessment assumes no future activity. Current Condition was the existing situation at the time of data collection during the Fall of 1994.

b. Environmental Effects

The following assumptions where used in the assessment of effects of the proposed treatments on hazard. The time period maximum of 20 years is considered the longest time interval before further management activity would be prescribed. Treatments which harvest timber and/or cut vegetation without treating the slash increase the hazard rating to HIGH. Hand piling and burning reduced the hazard rating by one factor (e.g., HIGH to MODERATE, MODERATE to LOW). Density reduction treatments in both the overstory and understory with underburning or hand piling and burning reduce the hazard rating to LOW. Broadcast burning and underburning reduce the hazard rating to a LOW category. Understory treatments in conjunction with prescribed burning are considered beneficial in both the short and long term as the effect of ladder fuel reduction and stocking reduction creates a fuel profile that is less susceptible to fire reaching the tree crowns.

Stands that are not or will not be at or near mature conditions within the 20 year time frame are still susceptible to stand replacement from wildfire events due to conditions such as thin bark, high crown ratios, presence or ability to reestablish ladder fuels, and continued stand mortality. The trend in these stands is for treated and untreated areas to increase in hazard as vegetation in the understory increases, crown closure occurs, and dead and down fuels accumulate. For those stands that were underburned and are at or will reach mature conditions within the 20 year time frame, it was assumed that these stands would remain in the LOW hazard rating. Stands that are currently younger and in mid serial stage conditions, and would not have as much down fuel removed (hand pile burn units) increase in hazard by the long term period and return to the HIGH and MODERATE rating categories.

Table 6 assumes treatments on a total of 683 acres. Harvest (CT/SR), understory treatment, and

prescribed fire use within approximately 356 acres; Commercial thinning (CT) and understory treatment, and prescribed fire use within approximately 110 acres; understory thinning (PCT) or Oak/serpentine meadow restoration work and prescribed fire use within 217 acres. Actual use of prescribed fire is anticipated to occur on no more then 60 to 70% of the 683 treatment acres.

1) Alternative 1: No Action

The No Action Alternative would continue the current trend of increasing the fuel hazard over time (See Table 6). With the absence of natural, low-intensity, frequent fire occurrence, dead and down fuels and live fuels will increase over time. The fuels buildup creates conditions that lead to high-intensity, stand replacement fire. The current condition has 73% of the area in a high hazard condition. This increases to 76% within the short time period. The large percentage of high hazard is a result of the dense stocking, multi-canopy nature of the much of the vegetation in the project area. The trend of increasing high hazard fuel conditions will continue and reaches 87% of the acreage in the 10 to 20 year long-term time frame.

2) Alternative 2: Proposed Action

Alternative 2, the proposed action, includes hazard reduction treatments. These treatments reduce and remove fuels. The hazard reduction treatments have a positive benefit and shift those acres into lower hazard conditions (See Table 7). Alternative 2 would have a short term (5-10 years) affect of reducing the amount of high and moderate hazard from the current combined 95% to a combined 46%. The amount of lands in the low hazard goes from the current 5% level to 54% for short term. The hazard rating would remain below the current level and No Action Alternative level throughout the 20 year analysis period.

Table 7 indicates proposed treatments within current hazard rating areas.

Table 7: Proposed Fuels Treatments within each Hazard Rating by Acres and Percent for 683 Acres of BLM Lands within the Free & Easy 2 Project Area

TREATMENT	HIGH HAZARD	MODERATE HAZARD	LOW HAZARD
CT/SR, with SS and PRESCRIBED FIRE TREATMENT of and/or HP/B,L&S, UB	34 % 234 acres	18 % 122 acres	0% 0 acres
CT, with SS and PRESCRIBED FIRE TREATMENT of and/or HP/B,L&S, UB	15 % 105 acres	1% 5 acres	0% 0 acres
RESTORATION TREATMENTS or SS with PRESCRIBED FIRE TREATMENT of and/or UB, HP/B	23% 159 acres	3 % 20 acres	5 % 38 acres
TOTAL	73 % 498 acres	22 % 147 acres	5 % 38 acres

The effects of hazard reduction treatments in Alternative 2 reduce hazard conditions in both the long and short term. A wildfire occurrence within the treated areas would result in less severe effects due to the reduction in fuel amounts. The removal of dead and down fuel and ladder fuel from the forest areas reduces the amount of fuel available to burn when wildfire occurs in those areas. Wildfire will burn with less intensity, duration, and flame length. The proposed treatments would create areas of

lower intensity burning which enable suppression forces opportunities to contain the fire spread. They also provide less fuel to "feed" a large fire and add to its energy. This increases the ability of fire suppression forces to protect forest resources, homes and structures and to limit the size of wildfire. Reducing the size and amount of high intensity burn area from a wildfire would have a short term beneficial effect in maintaining the forest and visual resources within the watershed, as well as reducing effects on stream and water quality.

c. Cumulative Effects

1) Alternative 1: No Action

Hazardous fuels will continue to build up and increases the potential for large scale, catastrophic fire occurrence. This has the potential to impact both the project area and the adjacent drainages. Large scale catastrophic fire events are natural but rare events within the project location and the vegetation plant associations. Impacts of such an event on visual, wildlife, and forest conditions would be extreme. The percentage of acres that burn in high intensity could range from 30 to 60%, with as little as 20% or less burned with low intensity.

2) Alternative 2: Proposed Action

The proposed harvest and non harvest stocking density reduction and restoration/fuel hazard reduction treatments in this Alternative would substantially reduce the fuel hazard within the project area. When wildfire occurs the potential effects would include a mosaic of fire intensities. A wildfire of 100 acres or larger would exhibit areas of high intensity burning producing total stand replacement, areas of low intensity underburn with little overstory mortality, and areas with a mixture of both extremes side by side. Location of the extreme fire effect areas would be a function of the presence of steep slopes, hot aspects, amount of fuel present, fuel continuity, presence of ladder fuels, and weather conditions at the time of fire occurrence. Vegetation density reduction and fuel reduction treatments will reduce the proportion of burned area in the higher intensity burn conditions. A wildfire occurrence following these treatments could have less than 20% of the area in high intensity and 50% or more experiencing low intensity burning.

Maintenance treatments will be necessary in order to maintain low fuel hazard condition levels. These would be needed approximately 3 to 10 years after the treatments proposed in this EA. These treatments would involve understory thinning and hand piling and burning as well as underburning. These treatments and effects are not included in this EA and would require a separate analysis in the future.

6. Resource: Wildlife

a. Introduction

The proposed action lies in two fifth field watersheds: the Illinois/Josephine and the East Fork Illinois watershed. The Illinois/Josephine watershed includes the Illinois/Kerby 6th field watershed where the majority of the proposed action is located. The proposed action lies primarily in the Chapman, Holton, and Reeves Creek drainages all of which are tributaries to the Illinois river.

Federal lands in the Kerby watershed are managed by the BLM, and the Forest Service. The BLM manages 6,247 acres (33% of the watershed) and the Forest Service 2,083 acres (11%). The landscape is split into two distinct parent soil types, dissected by the Illinois River, with the soils being a major influence on the type of vegetation and wildlife habitat. The west side of the Illinois is dominated by serpentine soils which supports open stands of Jeffrey pine, incense cedar (Jeffrey pine plant series) and chaparral communities, with small inclusion of soil which support Douglas-fir dominated forest. The patches of conifer forest function as islands of stable conditions during periods of inclement weather and provide optimal thermal habitat for big-game as well as disjunct areas of late-successional forest habitat. BLM managed lands on the east side have soils of deep clay loams which support and support grassland valley habitats which blend into Oregon white oak into Douglas-fir/ponderosa pine associated forest, with tan oak association occurring on the more productive ground. Douglas-fir/Ponderosa pine/tanoak associations are all capable of producing late-successional forest habitat. Inclusions of serpentine soils found here generally are dominated by grassland and or chaparral communities. Past land management action within this watershed include recreation, mining, fire suppression, road construction, and timber harvest.

Federal lands in the East Fork watershed are managed by the BLM and the Forest Service. The BLM manages 5,043 acres (9%) and the Forest Service 20,995 acres (36%). Approximately 20,500 acres of the East IV/Williams-Deer LSR is located in the southern portion of this watershed and is managed by the Forest Service. This watershed has soil types and forest types more typical of southwest Oregon. Small serpentine influenced soil pockets are present, but do not dominate the landscape. Habitats here range from un-managed stands of old-growth forest to early seral plantations. Past land management actions within this watershed include recreation, mining, fire suppression, road construction and timber harvest.

As of this date, surveys have not been completed for all Special status species including species identified as Survey and Manage species (see Appendix J-2 of the Record of Decision), but potential habitat does exist throughout the proposal area. For the following discussion, impacts for these species will be based on potential alteration of potential habitat. It will be assumed that habitat is occupied. The actual real effects would be equal to or less then what is being analyzed.

The lands within the project area provides habitat for a number of sensitive species including two pairs of Northern Spotted owl* (*Strix occidentalis caurina*), Red tree vole* (*Phenacomys longicaudus*), Great Gray owl (*Strix nebulosa*), Tail dropper slugs* (*Prophysaon spp*.), Red-Tailed hawk (*Buteo jamaicensis*), Marbled murrelet (*Brachyrampus marmoratus*), Bald Eagles (*Haliaeetus leucocephalus*) Del Norte Salamanders (*Plethodon elongatus*), Goshawks (*Accipiter gentilis*), and other raptors as well as all five species of Buffer species bats identified in Record of Decision (ROD)(* these species have been detected). Habitats within the planning area include woodlands, riparian, meadows, late-successional forest, snags, down wood, Jeffrey Pine savannahs, serpentine meadows, and brushfields.

The BLM manages 6,247 acres of land in the Kerby 6th field watershed of which approximately 923 acres (15%) are late-successional forest habitat as indexed by McKelvey classes 1 and 2 (Northern Spotted Owl nesting, roosting and foraging habitat). Topography, soils, past fire history and logging have combined to create a diverse and highly fragmented level of late-successional forest habitat in the watershed. The majority of late-successional forest habitat is located on the east side

of the watershed in the Holton creek drainage.

The BLM manages approximately 5,043 acres in the East Fork Illinois watershed of which 920 acres (18%) are late-successional forest habitat (McKelvey classes 1 and 2). The majority of this habitat is located in the southern portion of the watershed along Little Elder Creek and the East Fork Illinois River near the town of Takilma and in the northern portion of the watershed in the Chapman creek drainage. The central portion of the watershed is primarily under private ownership and except for some small in-holdings is, devoid of late-successional forest habitat. The majority of the BLM ownership in the watershed is capable of producing late-successional forest habitat. Plant series capable of producing late-successional habitat include tanoak, tanoak/Douglas-fir, Douglas-fir, and Douglas-fir/ponderosa pine.

b. Habitats - General

1) Affected environment: project level scale

The project area lies predominantly in the Kerby watershed which drains into the Illinois river. Elevations range from 2,558 feet on the top of Lime Rock to 1,280 feet along the banks of the Illinois River. The proposed project area incorporates approximately 769 acres in which a series of actions are proposed including fuel reduction, wildlife habitat improvement projects, as well as timber harvest. Timber harvest is proposed on approximately 475 acres under the action alternative. Most of the stands are dominated by Douglas-fir and ponderosa pine plant associations. The majority of them will be treated for the first time under the action alternative. Approximately 378 acres of late-successional habitat are being proposed for commercial harvest. These stands provide potential habitat for a variety of old growth/mature forest associated wildlife species such as the northern spotted owl, northern goshawk, red tree vole, brown creeper and hermit warbler. This habitat is located sporadically across the project area due to inclusion of serpentine soils which results in a naturally fragmented forest landscape. As a result the habitat and connectivity corridor/refugia they provide are extremely important for late-successional dependent species.

Non-forested habitats such as serpentine meadows, chaparral brushfields, oak woodlands and Jeffrey Pine savannahs are prevalent in the project area. These habitats are partially dependent on fire for maintenance and restoration. The majority of these lands have not burned for more than 50 years and are currently at the edge of their natural range of conditions. Under natural conditions the fire return interval into these habitat types range from 10-25 years.

The condition of the riparian areas vary greatly in the watershed due to the level of past management including fire suppression, logging and road building. In general, fire suppression has lead to an increase in down wood and vegetation densities. Past timber harvest in some riparian areas has led to areas dominated by early seral vegetation younger forest with more simplified forest structure (even age). A series of natural surface roads are located throughout the project area, many of which are in various states of decay (plugged culverts, sloughing banks) which are contributing to poor functioning streams and riparian areas. Other portions of the drainage have never been entered for timber harvest, such as Chapman Creek, and have ecological functioning riparian vegetation which provide high quality late-successional forest habitat.

2) Environmental consequences of vegetation treatments

a) Alternative 1: No Action

The no action alternative would be both beneficial and potentially detrimental to wildlife species. Late-successional forest habitat levels would continue at their current rate providing habitat and dispersal opportunities for a host of late-successional dependent species. Snag and down wood cycling would continue unabated. Species utilizing this habitat such as the Pileated woodpecker would benefit from the increased level. The forest maturation process would continue at the current rate. Development of larger trees and canopy layers would continue at their current rate. Stand development patterns would continue to differ from the pre-fire suppression period (natural disturbance regimes). Fire would continue to be excluded from the ecosystem to the greatest extent possible and forest fuels would continue to accumulate. Existing fire conditions in understory and surrounding vegetation will continue to put the existing old growth and mature habitat at risk for a stand replacing fire. The actual effects of a potential fire are impossible to gauge. Late-successional forest habitat can benefitted as well as be devastated by a fire depending on the severity. A moderate ground fire may benefit late-successional forest by creating gaps in the canopy, encouraging shade intolerant tree species and increasing the forest complexity. Tree species that are high fire tolerant and shade intolerant such as California black oak, Oregon white oak, and pine would continue to be lost from the stands. Stand structure complexity would continue to be simplified by the loss of tree species providing horizontal structure such as Pacific madrone and California black oak until such time that gaps in the conifer overstory are opened through suppression and mortality. Species utilizing these tree species for mast and berry crops as well as cavities and nesting structure would lose a food source as well as habitat.

Early seral forested stands would continue to develop on their current successional trajectory. Species utilizing early forest conditions such as deer would slowly lose their current level of browse through succession.

Trends in pine, oak, Jeffrey pine savannahs and serpentine meadows would continue with a decline of their extent and vitality due to the invasion and encroachment by fire intolerant species. Current trends in habitat change of these plant associations adversely affect wildlife species like the flamulated owl, western blue bird and violet green swallow. These birds species prefer the white oak and ponderosa pine plant associations for nesting and foraging and have been experiencing population declines in the past 10 years (Andelmand and Stock 1994). Areas dominated by chaparral community plants such as wedgeleaf ceanothus would continue to become decadent. Species depending on this plant for winter forage such as the black-tailed deer (*Odocoileus hemionus)* would continue to lose this important browse plant. Other species which dependent on chaparral for nesting structure such as the Wrentit (*Chamaea fasciata)* would continue to lose potential nesting structure.

Riparian areas and associated upland vegetation would continue to develop at their current rate. Areas dominated by early seral vegetation would continue to hinder the dispersal of species associated with older forest but provide habitat for species associated with early seral vegetation. Areas with mature/old growth forest would provide for quality dispersal habitat for species associated with older forest.

b) Alternative 2: Proposed Action

Alternative 2 will reduce the amount of late-successional forest habitat on the BLM portion of the Kerby 6th field watershed from 985 acres to 680 acres. Within the watershed, late-successional forest habitat will be scattered and fragmented with the largest remaining block being the 100 acre core established for the Holton creek spotted owl pair. The loss of acreage of late-successional forest habitat (31%) within the Kerby watershed would adversely affect late-successional forest species through habitat loss and fragmentation. Species with large home range requirements such as the spotted owl would most likely be lost in the project area. Species with smaller home range requirements such as the Red tree vole maybe able to persist in the project area, but may be isolated from other such populations until such time when habitat conditions recover (20 years).

This alternative would reduce the acreage of late-successional forest habitat on the BLM portion of the East Illinois River watershed from 960 acres to 905 acres. Approximately 92% of the current amount of late-successional habitat will remain. Four blocks of late-successional forest habitat greater then 100 acres in size would remain in the watershed on BLM managed land. These blocks are in the Chapman (section 13 and 14) and Elder (section 24) creek drainages as well as flanks of Mt. Hope (section 35) and along the East Fork of the Illinois river (section 34). The remainder of the late-successional forest habitat is widely scattered and occurs in small parcels. Connectivity through the watershed is poor due to the conversion of forested areas into home sites and agricultural land and habitat conditions on public land. The loss of late-successional forest habitat will adversely effect species which require large home ranges of older forest such as the Northern spotted owl.

Two prescriptions types are being utilized under the proposed alternatives: commercial thinning with modified group selections, and structural retention harvests. Stands which receive a commercial thin with a modified group selection retain some of the structural components of older forest including a recruitment source for snags/down wood, large trees and multi-story canopies, but may lack the high canopy closure associated with late-successional forest habitat. It is anticipated that post-harvest, these units will retain approximately 40% canopy closure. These areas will allow for a greater competition between generalist wildlife species and old forest obligates. Micro-climatic conditions and micro-sites that some species need may not be met in stands with canopy closure less then 40%. For example *Prophysaon* slugs (survey and manage species) may be eliminated due to warmer drier conditions anticipated post-treatment. In general, these areas will no longer provide late-successional forest habitat. In addition the more open conditions may led to increase in predation as more generalist species such as the Great horned owl (*Bufo virgianus)* move in and compete with interior forest species.

Tree species that are highly fire tolerant and low shade tolerant will be retained in the stand. This includes species such as California black oaks and Pacific madrone that provide the majority of the horizontal structure in the late-successional forest in the project area. These trees improve the overall quality of the forest by producing mast and berries, as well as providing nesting and resting structure for wildlife. They are also host plants for a number of mycorrhizal species that produce fruiting bodies that species such as the Northern flying squirrel (*Glaucomy sabrinus*) uses as a primary food source. In addition, a number of mollusc species are known to utilize hardwoods litter as food. Retaining these components in the forest maintains a structure more similar to natural conditions.

Stands receiving a structural retention prescription will have an anticipated post harvest average canopy closure of approximately 25%. A minimum of 16-25 trees will remain per acre both in aggregate and dispersed. These stands will provide early seral conditions with scattered remnant large trees from the original stand.

Snag levels within the project area vary due to past land management activities. Stands that have never been managed for timber are generally rich in snags and exceed the minimum level considered to be optimal for 100% retention (3.1 per acre) but have the potential to have levels impacted by timber harvest. Other units that have been entered in the past for timber harvest may currently have snag levels that are less than target levels. In these units, species associated with snags and down logs have been negatively impacted. Project design features will retain snags where feasible and has a goal of three per acre post treatment, but loss of snags to facilitate harvest and provide for safe logging conditions will contribute to the loss of additional snags and a reduction of the current snag level and the associated wildlife.

Proposed Mitigating Measure #2. In areas of low snag levels, buffer snag clusters (>6 snags) by one tree length to ensure that the project area retains a high level of snags.

3) Environmental consequences of road work

Under Alternative 2, approximately 2 miles of new temporary road would be constructed in the project area. An additional 0.3 miles are proposed for new permanent construction. In addition, 3.4 miles of currently un-driveable road would be renovated and gated post. Currently, access into the proposed action area east of the Illinois river is poor, with little motorized use. The new road construction and road renovation will allow for greater access and greater potential disturbance to wildlife. The opportunity for off-road vehicles to utilize the new road bed will still remain even after gating the road. Off-road vehicle use may increase, causing increased disturbance to wildlife, which leads to stress thereby causing reduced reproduction, higher mortality and increased poaching.

The road work may lead to increase traffic to three caves in the project area, caves that are used by Pacific western big-eared bat, a bureau species of concern. This species of bat is extremely vulnerable to disturbance, particularly during the winter when a disruption in their hibernation cycle may burn critical fat reserves leading to the individuals death. Currently the road into the site is in poor condition which limits the amount of traffic to the area. An increase in traffic may lead this species to abandon the caves, seeking less optimal sites.

Proposed Mitigating Measure #3: In addition to installing the gate at the junction of Laurel road and Road 39-8-23, effectively tank trap the road (after completion of proposed actions including site preparation and burning) the road at or near the section line of sections 14 and 23 to prevent vehicles from accessing the caves.

4) Environmental consequences of fuels treatments

a) Alternative 1: No Action

Under Alternative 1, the current vegetation trajectory would continue. Stand densities would

continue to increase to a point where stagnation and mortality would begin to select out individual trees. Species associated with snags and down wood, such as the woodpeckers would benefit from the increase in habitat. The risk of stand replacing fire would continue to be high. The probability of a stand replacing fire would continue to increase. The potential loss of late-successional forest habitat through a stand replacing fire could led to localized extirpation of species associated with this habitat.

b) Alternative 2: Proposed Action

The reduction in fuel loading, tree density and ladder fuels will reduce the opportunity for a stand replacing fire in the project area. Under the action alternative, fuel loads would be reduced in the project area., while snags and down wood habitat would be diminished. Species associated with down wood such as the Ensatina salamander (*Ensatina eschscholtzii)* would lose habitat. The reduction of hazard would lessen the possibility of a stand replacing fire in the proposed action area, and the potential risk to late-successional habitat would be reduced.

Habitats such as oak woodlands, serpentine meadows and Jeffrey pine savannahs would be restored towards a pre-fire suppression condition and would be more within their natural range of conditions. There would be a loss of habitat for some species such as Spotted towhee (*Pipilo erythrophthalmus*), but this would be naturally mitigated by the mosaic fashion of the burn. It is anticipated that portions of the units would receive little or no fire, while other areas may be burned more intensely. Quality winter range for species such as elk (*Cervus elaphus*) would begin to be restored, improving browse conditions for this species. In general, the mosaic vegetative nature of the project area and the unique habitat they represent will be restored and preserved, benefitting species associated with these habitats.

c. Species of Concern

1) Northern Spotted Owl

a) Existing environment

There are approximately 985 acres of suitable spotted owl habitat on BLM lands in the Kerby watershed and 960 acres in the East Fork Illinois watershed. The majority of this spotted owl habitat is located in the eastern portion of the Kerby watershed and the northern and southern portion of the East Illinois River watershed. Approximately 680 acres of spotted owl habitat is located outside the project area in the Kerby watershed and 905 acres in the East Fork Illinois watershed. There is no identified Critical Habitat within the project area. Currently there are two 100 acre core areas designated on BLM land, one in each of the two watersheds.

b) Environmental Consequences

(1) Alternative 1: No Action

The two spotted owl sites within 1.3 miles of the proposed project would remain at their current habitat level (see Table 8), which is below the viability threshold of 1,388 acres (USFWS standard). It is unknown if these sites will continue to nest and produce young in the long run due to the low level habitat. The forest maturation process would continue which would be beneficial to the Spotted owl. The potential for a fire in the project area would remain high.

(2) Alternative 2: Action Alternative

The action alternatives would alter 360 acres of suitable spotted owl habitat from nesting, roosting and foraging to dispersal habitat conditions. Within the BLM portion of the Kerby 6th field watershed, spotted owl nesting, roosting and foraging habitat would be reduced from 985 acres to 680 acres, a reduction of 31%. Within the BLM portion of the East Fork Illinois 5th field watershed, spotted nesting, roosting and foraging habitat would be reduced from 960 acres to 905 acres a reduction of 6%. It is likely that the two known owl sites will be displaced as a result of insufficient suitable habitat and both sites eliminated from further production.

The action would lead to the reduction of forest canopies below the 60% level which is considered to be a minimal for quality spotted owl habitat. Species dependent on late-successional forest would lose breeding (nesting), roosting and foraging habitat. Interior forest conditions would be lost, exposing interior species such as the spotted owl to higher amounts of predation. The ability of late-successional forest species such as the Spotted owls to persist in the project area and re-populate habitat within the next 20 years or (until the canopy closes) would be hindered. Connectivity through the Kerby and East Illinois watershed would be furthered fragmented for species dependent on older forest. This would most likely result in the local reduction in the spotted owl population and could result in depressed genetic information in the local gene pool. Refugia of late-successional forest habitat in the drainage would be highly adversely impacted. The action would affect three provincial home ranges of spotted owls which have established core areas.

Precommercial thinning and commercial thinning stands that currently are not late-successional habitat may accelerate the development of this habitat or place these stands on a trajectory they may lead to a more structurally complex forest. Approximately 41 acres of precommercial thinning/fertilizing is proposed under the action alternatives.

The USFWS uses thresholds for the amount of suitable habitat around spotted owl sites as an indication of a sites' viability. Thresholds to determine incidental take have been defined as 40% of the area within 1.3 miles of the center of activity or about 1,388 acres. Incidental take, in this case habitat modification will occur at 2 Northern spotted owl sites. Table 8 displays the effect the proposed actions would have on spotted owl sites. This project has undergone formal consultation with the USFW. Consultation took place for the original Free and Easy project in 1995. Consultation for Free & Easy 2 took place initially occurred in 1998 and is addressed in the FWS's Biological Opinion (#1-7-98F-392). Due to delays in project preparation and anticipated timber sale implementation, Free & Easy 2 will be resubmitted for consultation.

Table 8: Effects of Proposed Action on Northern Spotted Owls			
Site	Preharvest habitat acres within 1.3 mi	Postharvest habitat acres within 1.3 mi	% suitable habitat within 1.3 miles
Holton Creek	615	430	12.5
Chapman Corners	493	367	10.6

2) Red Tree Vole

The Red tree vole is an arboreal species of rodent with very low dispersal capabilities. The broad management objective for this species is to retain sufficient habitat to maintain its potential for reproduction, dispersal and genetic exchange. Surveys for the Red tree vole have located the species throughout the project area.

(a) Alternative 1: No Action

The forest would continue to go through developmental stages towards older forest conditions which would be beneficial to the RTV and other species associated with late-successional forest habitats. The potential for a fire in the project area would remain high.

(b) Alternative 2: Proposed Action

At the project level, the proposed commercial thinning will probably have an adverse effect on red tree vole habitat quality due to the decrease in canopy closure and the increase in potential predation. On a regional scale, the proposed action should not diminish the viability of the population as a whole due to the application of the management recommendations.

The proposed precommercial thinning and brushing throughout the project area, may hasten the development of potential red tree vole habitat in the future which could contribute to the maintenance of the species in the project area and watershed.

3) Northern Goshawks

Potential habitat for Northern Goshawks (*Accipiter gentilis)*, a bureau sensitive species, is located throughout the proposed treatment area. Surveys are not currently required, but some opportunistic surveys have been conducted, though not to protocol standards.

(a) Alternative 1: No Action

The forest would continue to go through developmental stages towards older forest conditions which would be beneficial to the Northern Goshawk and other species associated with late-successional forest habitats. Potential local populations would likely be maintained in the project area. The potential for a fire in the project area would remain high.

(b) Alternative 2: Proposed Action

The proposed commercial thinning and regeneration harvest would modify the affected habitat from a nesting to non-nesting condition/quality. It is estimated that 360 acres of nesting habitat would be modified to non-nesting habitat. The timber harvest may lead to a reduction in the local population of goshawks. The proposed action's precommercial thinning and brushing would hasten the development of potential goshawk habitat in the future which could contribute to the maintenance of the species in the project area and watershed. (If the species is encountered, appropriate measures would be taken to protect the site per the E-4 Timber Sale Special Provision.)

4) Del Norte Salamanders

Potential habitat for Del Norte salamanders (*Plethodon elongatus*) is located in sections 11 and 14 of the proposed project area. These salamanders are intricately tied to areas with rock and talus. This type of micro-habitat is sporadically distributed across the landscape, occurring primarily near rock outcrops, ridge tops, and along riparian areas. Current management directions require a 100' or 1 site potential tree buffer around known sites which ever is greater.

(a) Alternative 1: No Action

The forest would continue to go through developmental stages towards older forest conditions which would be beneficial to the Del Norte salamanders. The potential for a fire in the project area would remain high.

(b) Alternative 2 : Proposed Action

The action alternatives do not propose to harvest within the buffers. Thus there are no effects anticipated to the species.

5) Great Gray Owl

Great gray owl (*Strix nebulosa*) habitat is located in throughout the project area. Locally, Great gray owls have been located nesting in a variety of stand types, but a closed canopy (>60%) and room for flight is a common factor. Foraging occurs in open stands, old clearcuts, natural meadows, and agricultural land. The current protocol for this species does not require surveys below 3,000 feet elevation. Sporadic surveys for this species have been on-going in the best locations in the project area but not to protocol standards.

(a) Alternative 1: No Action

The forest would continue to go through developmental stages towards older forest conditions which would benefit Great Gray Owls by increasing the amount of nesting habitat. Foraging areas would continue to be encroached upon by fire intolerant plant species reducing potential foraging opportunities. The potential for a fire in the project area would remain high which, if one were to occur, could substantially change habitat quality.

(b) Alternative 2: Proposed Action

It is anticipated that this project will modify 360 acres of existing habitat in the project area from nesting to non-nesting condition which could result in a local reduction in the great gray owl population. Foraging habitat would be improved by removing encroaching vegetation through the use of fire.

6) Song Birds

(a) Alternative 1: No Action

The forest would continue to go through developmental stages towards older forest conditions which would maintain the current bird community composition. Overtime, there would be an increase in numbers of species associated with snags and down logs as well as deep bark and forest gleaners and a decrease in birds associated with early seral vegetation and more open stand conditions. The potential for a fire in the project area would remain high.

(b) Alternative 2: Proposed Action

In 1994 a study was undertaken in the Panther Gap Timber sale (near Williams, Oregon) to measure the effects that commercial thinning has on the composition of the song bird community. The stands examined in the study are similar to the stands identified for commercial thins. Stands were measured for abundance and species richness (number of species), pre and post harvest. Due to the similarity of the stands it can be assumed that the effects of the proposed action alternative will be similar to those observed at Panther Gap Timber sale. Janes (1997) found that winter bird abundance on both south and north facing slopes were near 50% lower post harvest. Forest gleaners, the dominant group of winter birds, showed the largest declines. Species such as Chestnut-backed chickadees (*Parus rufescens*) and Red-breasted Nuthatches (*Sitta canadensis*) were among this group. It is hypothesized that these species declined due to decrease volume of foliage and bark areas and a decrease in the number of available cavities for roosting and nesting. There was a modest increase in terrestrial insectivorous in particular Winter Wrens (*Troglodytes troglodytes*) which apparently benefitted from the increased level of down wood.

Spring breeding bird populations showed similar results to those of the wintering birds. Species utilizing bark and foliage for foraging showed the greatest decline, while species utilizing down wood and open stand conditions increased. Species showing declines include Hermit Warblers (*Dendroica occidentalis*) and Nashville Warblers (*Vermivora ruficapilla*) as well as several other species. Species showing an increase include Mountain Quail (*Oreortyx pictus*), Hairy woodpeckers (*Picoides pubescens*) and House wrens (*Troglodytes aedon*). Overall, it appeared that timber harvest changed structural characteristics in the stands that resulted in decreased habitat for some species and increased habitat for others.

It is anticipated that structural retention harvest will led to a greater degree of shift of song bird populations away from species requiring high canopy closure and greater structural conditions such as Brown Creepers (*Certhia americana*) to species requiring early seral coniferous habitat as well as more open stand conditions such as Dusky Flycatchers (*Empidonax oberholseri*).

As the commercial thinning stands begin to respond to the treatment it is anticipated that the bird population will again shift to favor species utilizing dense forest stands. Within 20 years the bird community will be similar to the current community

7) Molluscs

(a) Alternative 1: No Action

The forest would continue to go through developmental stages towards older forest conditions which would be beneficial molluscs. There would be an increase in habitat conditions for species requiring late-seral conditions. Foraging opportunities for species that forage on hardwood leafs hardwoods would diminish as the trees are out competed in the stand. The potential for a fire in the project area would remain high.

(b) Alternative 2: Proposed Action

All lands identified for commercial timber harvest will be surveyed for Survey and Manage molluscs. If S&M molluscs are located during the survey, the approved management recommendations would be implemented. This group generally require cool moist environments with the exception of *Helminthoglypta hertleini* which may utilizes rocky talus on exposed slopes. Implementation of the management recommendations will minimize any adverse effects on these animals.

8) Marbled Murrelets

(a) Affected Environment

The entire project area is in the secondary zone (35-50 miles from the coast) and has been surveyed for Marbled murrelet. Nesting habitat for marbled murrelet consists of older forest stands with trees that have large moss-covered limbs or platforms and a high (70%) canopy closure. It is unknown at this time if the stand that contain components for marbled murrelet would be used by them. The stands in the project represent habitat that is generally hotter and drier then known occupied Marbled murrelet habitat. Surveys for this species were conducted in the project area in 1994 and 1995. No marbled murrelets were detected in the project area.

(b) Alternative 1: No Action

There would be no change to the quality of the murrelet habitat.

(c) Alternative 2: Action Alternative

There are no anticipated effects to the species.

9) Townsend's Big-eared bats

There are three limestone caves near the project area, two located on federally managed land and

one on private land. Historically all three caves were used by Townsend's Big-eared bats as day roost and hibernaculums. The site located on private land historically was one of the largest known maternity colony in southern Oregon. These bats are extremely sensitive to human disturbance and use of the sites by bats have varied with amount of human visitation. Currently there is limited access to the sites which appears to have help bolstered populations at the maternity colony.

(a) Alternative 1: No Action

Access to the sites would remain poor limiting the amount of disturbance. The would be no change to the surrounding forest. Potential for wildfire would remain high in the project area.

(b) Alternative 2: Action Alternative

The action alternative has the potential to adversely affect the species. Currently the site has limited access. The construction of the road system and helicopter landings will lead to an increase level of human activity in the area. Post-action, it will be very difficult to exclude off road vehicles from the area and most likely there will be an increase in off-road vehicle use in the project area. Utilizing helicopters to harvest trees within a ½ mile of the maternity colony and day roost has the potential to disturb the species to the point to which the sites may be abandoned. The loss or abandonment of the site would have a negative affect on the regional population of the bats. Smoke created from slash disposal and fuel management may drift down into the caves, possibly forcing the bats from their roost.

Proposed Mitigating Measure #4: Limit road maintenance/use and helicopter landing construction on the private road running through section 14 to the period September 1 through April 1.

Proposed Mitigating Measure #5: Limit helicopter logging of units 14-1 and 14-2 to the period September 1 through November 1.

Proposed Mitigating Measure #6: Limit prescribed fire activity from May through June and October to mid-April, or burn fuels when transport winds are blowing from the east or southeast to avoid smoke drift into the caves. If burning outside the described dates, monitor the cave entrances to ensure they remain smoke free.

d. Cumulative Effects

The two 5th watershed within which the proposed project area is located have been greatly altered by past management activities on all ownerships. Currently, the BLM and the Forest Service is in the process of planning the Upper Illinois River Landscape Management Project which *may* include up to 1,500 acres of vegetation treatments on BLM managed land in the East and West forks of the Illinois, and 755 acres on Forest Service land in the East Fork of the Illinois watershed. The reasonable foreseeable future actions that will take place in the matrix and on county and private land will include continued timber harvest. Species of late-successional dependent wildlife occurring on private and or county land will most likely remain unprotected. Currently the BLM and the Forest Service manage the majority of the remaining late-successional forest habitat in the

watershed. Timber harvest will continue on lands in the matrix land allocation and most likely result in the harvest of late-successional forest habitat. Future remaining stands of old forest will most likely be small blocks, which are widely scattered apart. This late-successional forest habitat supports a number of sensitive species and allows for dispersal between the East IV/Williams LSR and the West IV LSR to the Northeast in addition to providing habitat between the Cascade and Coast mountain ranges. Within the project area the remaining late-successional forest are, for the most part, islands of older forest surrounded by opening of serpentine soils and/or managed plantations. These stands of late-successional habitat are extremely important for supporting biodiversity and providing refugia for late successional species like red tree voles.

The result of these actions will be a reduction in the refugia capabilities of these stands, as well as a reduction in the ability of these stands to temporally and spatially function. This means that some late-successional forest species may be extirpated from the drainage as well as the eastern portion of the watershed due to habitat loss. Maintenance and development of late-successional habitat within these drainages largely will depend on the BLM and the Forest Service.

The proposed harvest will modify suitable habitat within the provincial home range of the two known BLM managed spotted owl sites in the two watersheds (see Table 8). There is a 50% overlap of suitable habitat on Holton Creek and Chapman Corners spotted owl sites, suggesting that the impacts will be greater than if there was no overlap of remaining suitable habitat. It is unknown if these spotted owl sites will continue to be occupied or productive. Worst case analysis in this situation would be the loss of both sites until habitat grows back and becomes suitable.

7. Resource: Special Forest Products

a. Affected Environment

Historically and currently, there is a high demand for fuelwood and small timber sales in the Cave Junction area. Other Special Forest Products, such as burls, mushrooms, poles, and manzanita are also harvested. However, in this specific project area, opportunities for Special Forest Products harvest are limited because most of the lands do not have road access.

b. Environmental Consequences

1) Alternative 1: No Action

There would be no change to the Special Forest Products availability.

2) Alternative 2: Proposed Action

There would be a small beneficial effect on the Special Forest Products program as follows:

- Approximately 5 acres of manzanita would be available for harvest, yielding about 5 tons of product in unit 39-8-17-002;

- Douglas-fir poles would be available for pre-harvest in the PCT unit 39-8-15-004, yielding

about 500 poles;

- Small amounts of hardwoods may be available in unit 39-8-17-002, yielding about 1-10 cords of fuelwood..

8. Resource: Recreation and VRM

a. Affected Environment

Recreational use of the area is dispersed and includes: equestrian, OHV, hunting, driving for pleasure, hiking, and bicycling. Recreational use generally follows existing roads and non-designated trails in the area. The project area encompasses roads and trails that are used by the locals year-round (mainly horses) and also used by the Limestone Challenge Equestrian Endurance Ride. This ride is a yearly event, sanctioned by BLM through a special recreation permit.

The proposed project area encompasses VRM Class III lands in close vicinity to the towns of Kerby and Cave Junction.

b. Environmental consequences

1) Alternative 1: No Action

Current trends of dispersed recreation on public as well as private lands would continue. There would be no visual alterations of the landscape.

2) Alternative 2

There will be no change in amounts of recreation opportunities provided. The visual effect on the recreation experience may be slightly more open as a result of forest management activities. Some openings may be visible from roads, especially along highway 46, but the activities will conform to the objectives of VRM III lands.

Chapter 4
Agencies and Persons Consulted/Monitoring

A. Public Involvement

As mentioned in Chapter 1, the Free and Easy 2 Forest Management Project has been developed based on the Free and Easy timber sale project (EA #OR110-96-03, with the Decision Record dated 11/22/95). The current plan includes a revision of the original Free and Easy plan, prescription and proposal with the addition of BLM parcels in 39-8-23 and 39-8-14. The Free and Easy 2 proposal incorporated the public comments received during the planning of the original sale as well as additional scoping period.

On August 9, 1991, the Grants Pass Resource Area Manager sent scoping letters to concerned groups and adjacent landowners soliciting comments and concerns regarding the project. Several comment letters were received at that time. On October 6, 1994, a public meeting was held in Kerby to solicit information and hear concerns from interested members of the public regarding the Kerby Watershed Analysis (WA). Comments can be found in Appendix D of the Kerby WA. Then, on March 24, 1995, the Grants Pass Area Manager mailed a follow-up scoping letter to concerned groups and adjacent landowners subsequent to the signing of the NFP. Twelve of the original planning units were still being considered for harvest after the initial screening. The Medford District of the BLM received several comment letters as a result of that solicitation.

The original Free and Easy EA was made available to the public for review on October 5, 1995. Twenty-two letters were received, commenting on the proposed action. Particular interest was received regarding the proposal within the Holton Creek drainage. Concerns expressed included the harvest of mature and old-growth trees, the amount of late-successional forest within the Kerby watershed, and comments regarding the pair of spotted owls known to inhabit the Holton Creek drainage.

Additionally, during the week of November 6, 1995, the BLM met with Holton Creek neighbors in the field to look and discus the units and the harvest tree mark.

Additional public scoping for Free and Easy 2 was initiated with letter sent to interested persons, adjacent landowners, and agencies on December 10, 1998. Eight responses were received from this. Three letters had substantive comments regarding project specifics, and the rest were requests to be kept informed and included in future mailings.

B. Availability of Document and Comment Procedures

A 30 day public comment period will be held. Notification of the availability of the EA will be sent to parties who are thought to be interested and will be published in the Grants Pass Courier and Illinois Valley newspaper. The EA will be available for public review in the BLM Medford District Office, on the Medford District's web site, and upon request.

Appendix A: Project Maps

Map 1: Vicinity Map

Map 2: Environmental Assessment Maps - Proposed Action

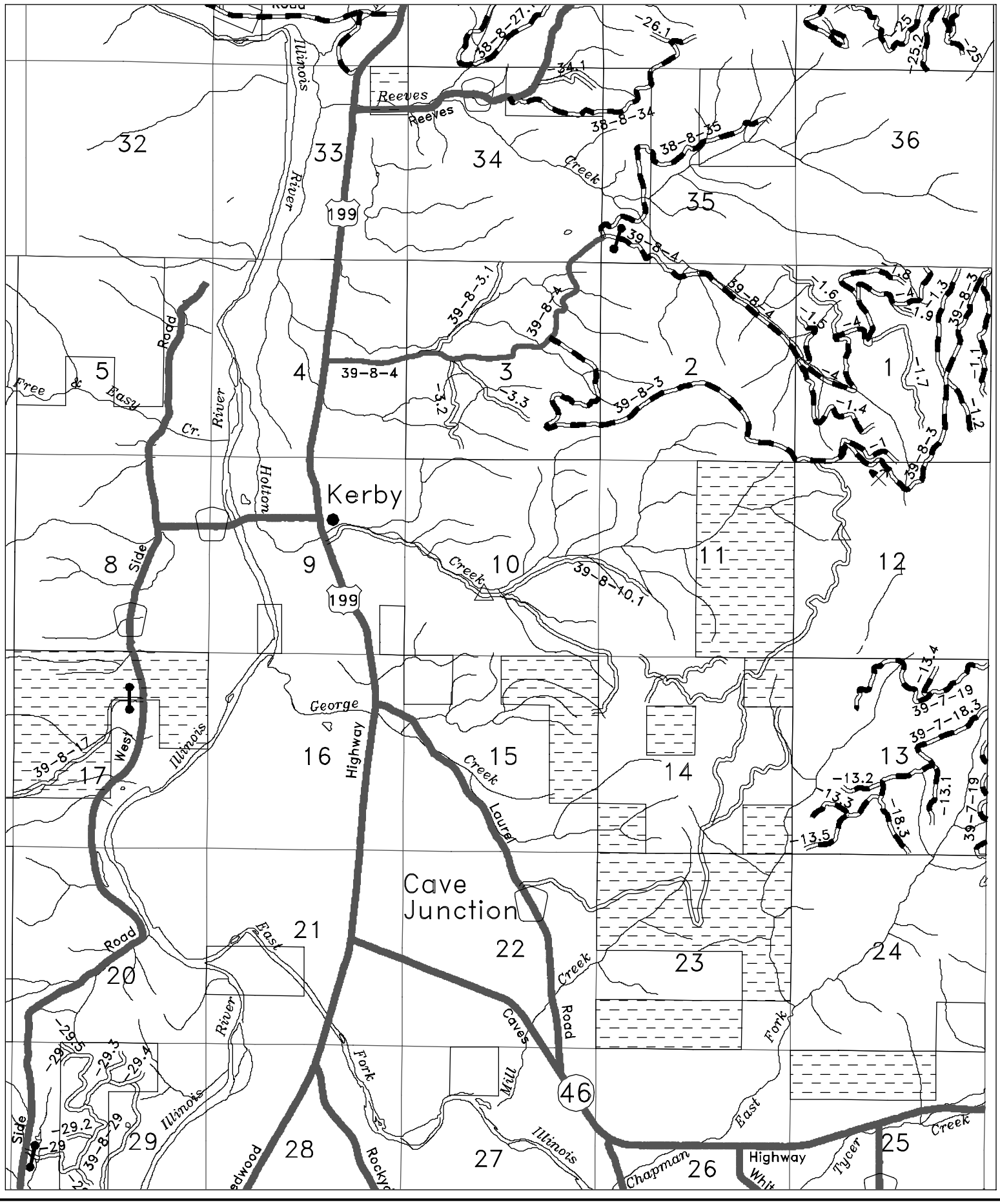
Free & Easy 2 Forest Management Project

Grants Pass Resource Area

Free & Easy 2 For. Mgmt. Project Planning Area

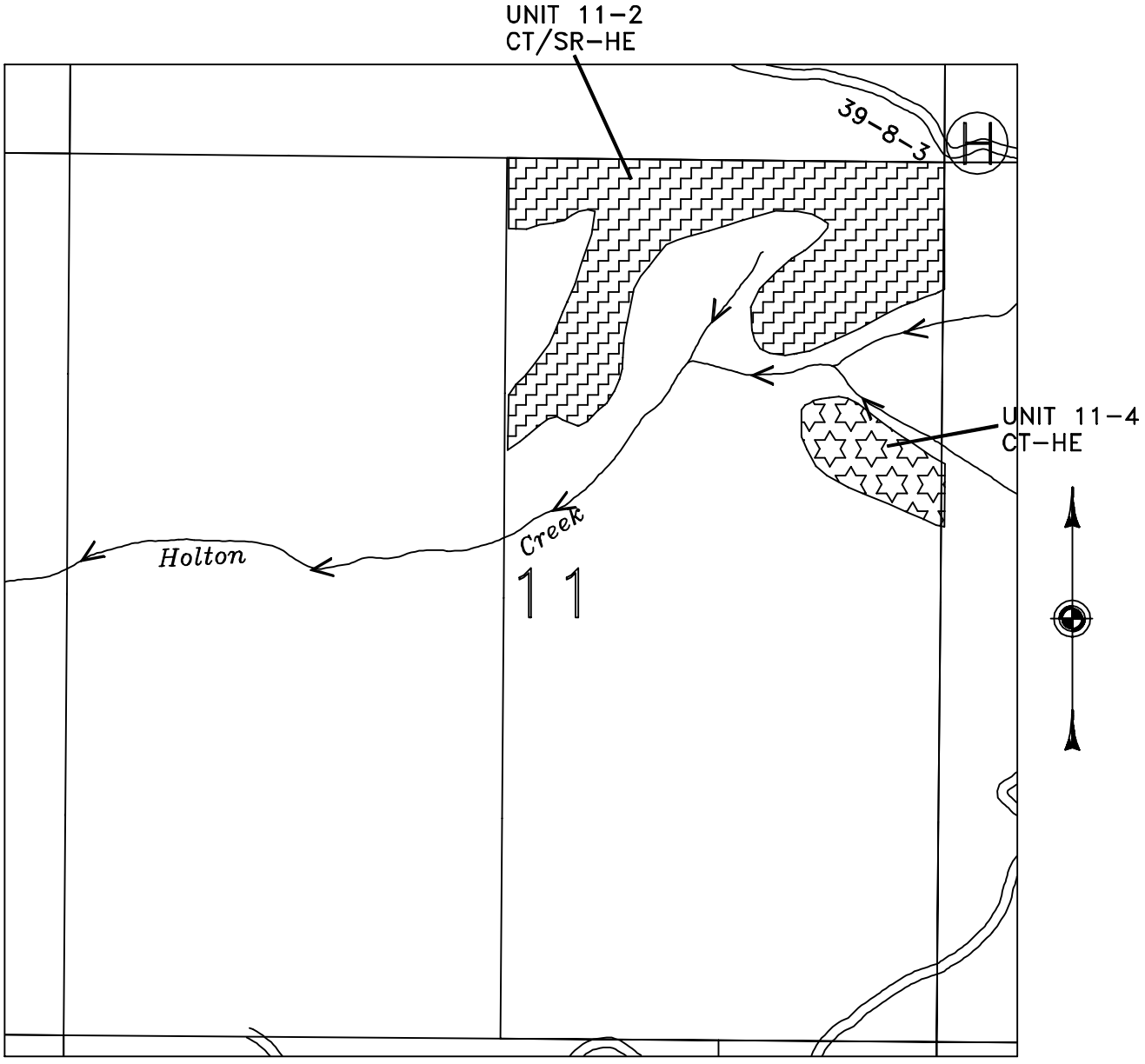
Map 1

Last edited 2 February, 2000



U.S.D.I. BLM MEDFORD DISTRICT
T.39S., R.8W.., SEC. 11, WILL. MER.
FREE & EASY 2 FOREST MANAGEMENT PROJECT

MAP 2
ENVIRONMENTAL ASSESSMENT MAP



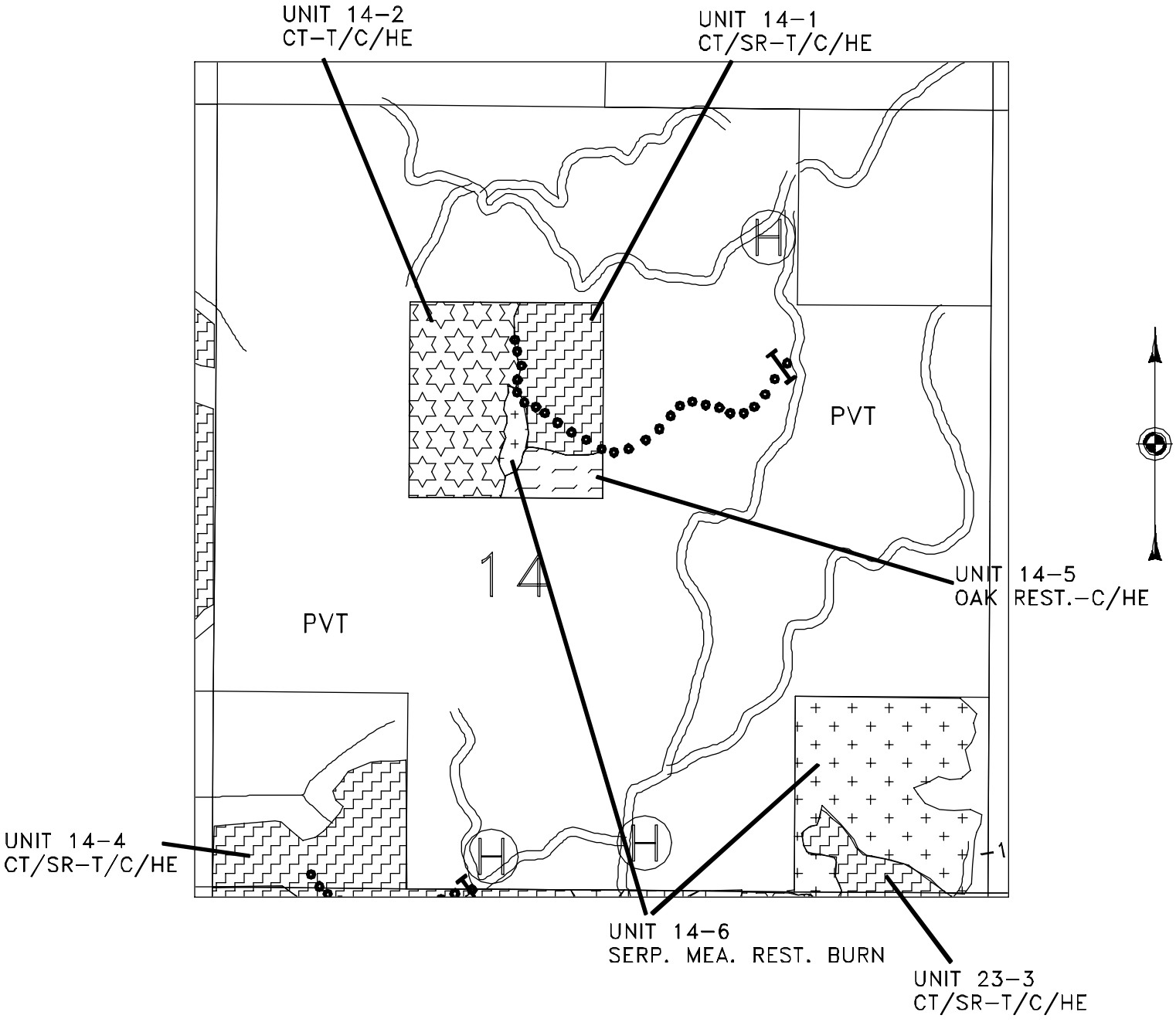
CONTOUR INTERVAL 100'

0 1000 2000

Feet

U.S.D.I. BLM MEDFORD DISTRICT
T.39S., R.8W., SEC. 14, WILL. MER.
FREE & EASY 2 FOREST MANAGEMENT PROJECT

MAP 2
ENVIRONMENTAL ASSESSMENT MAP
PAGE 2 OF 8

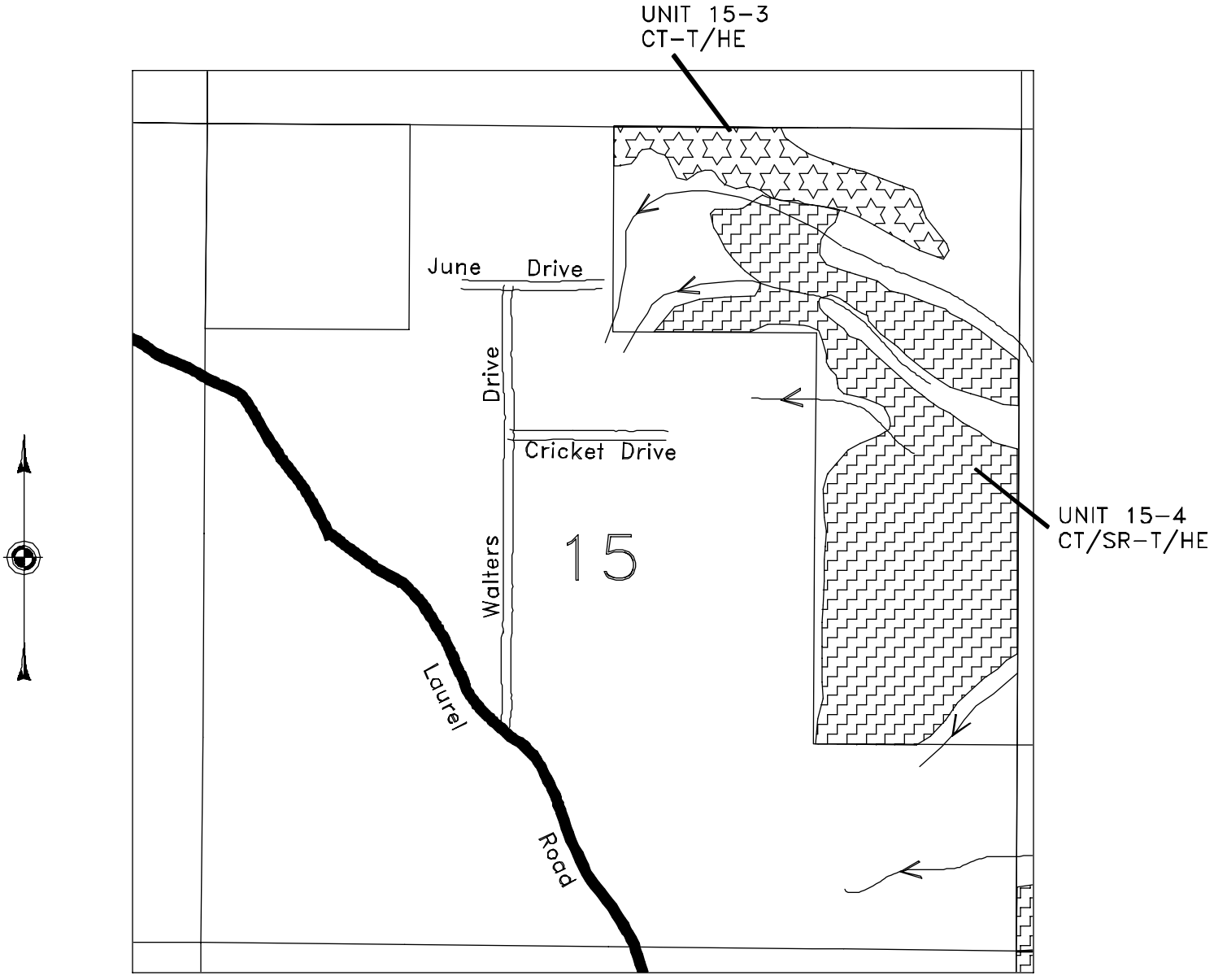


CONTOUR INTERVAL 100'

0 1000 2000
Feet

U.S.D.I. BLM MEDFORD DISTRICT
T.39S., R8W., SEC. 15, WILL. MER.
FREE & EASY 2 FOREST MANAGEMENT PROJECT

MAP 2
ENVIRONMENTAL ASSESSMENT MAP
PAGE 3 OF 8

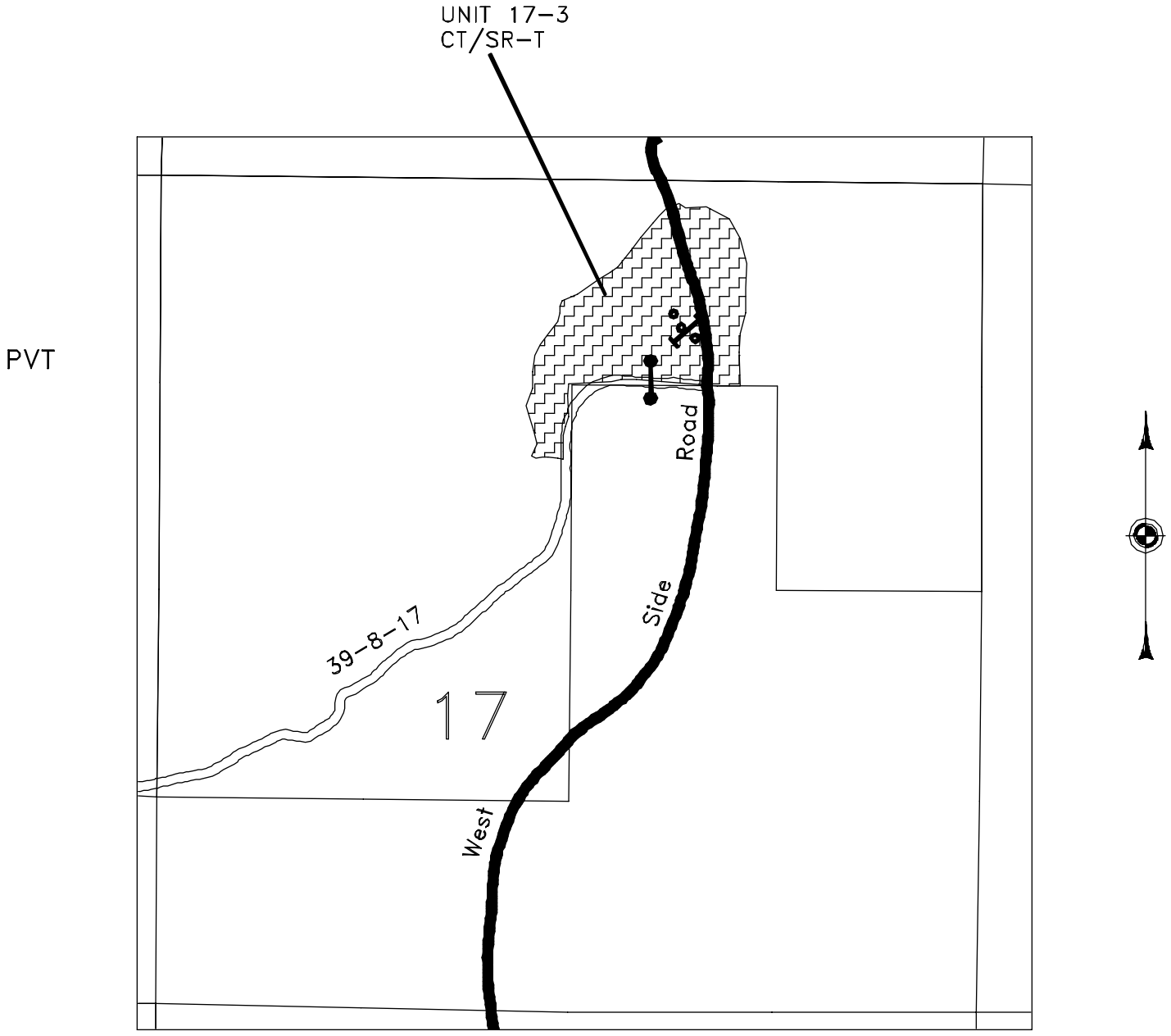


CONTOUR INTERVAL 100'

0 1000 2000
Feet

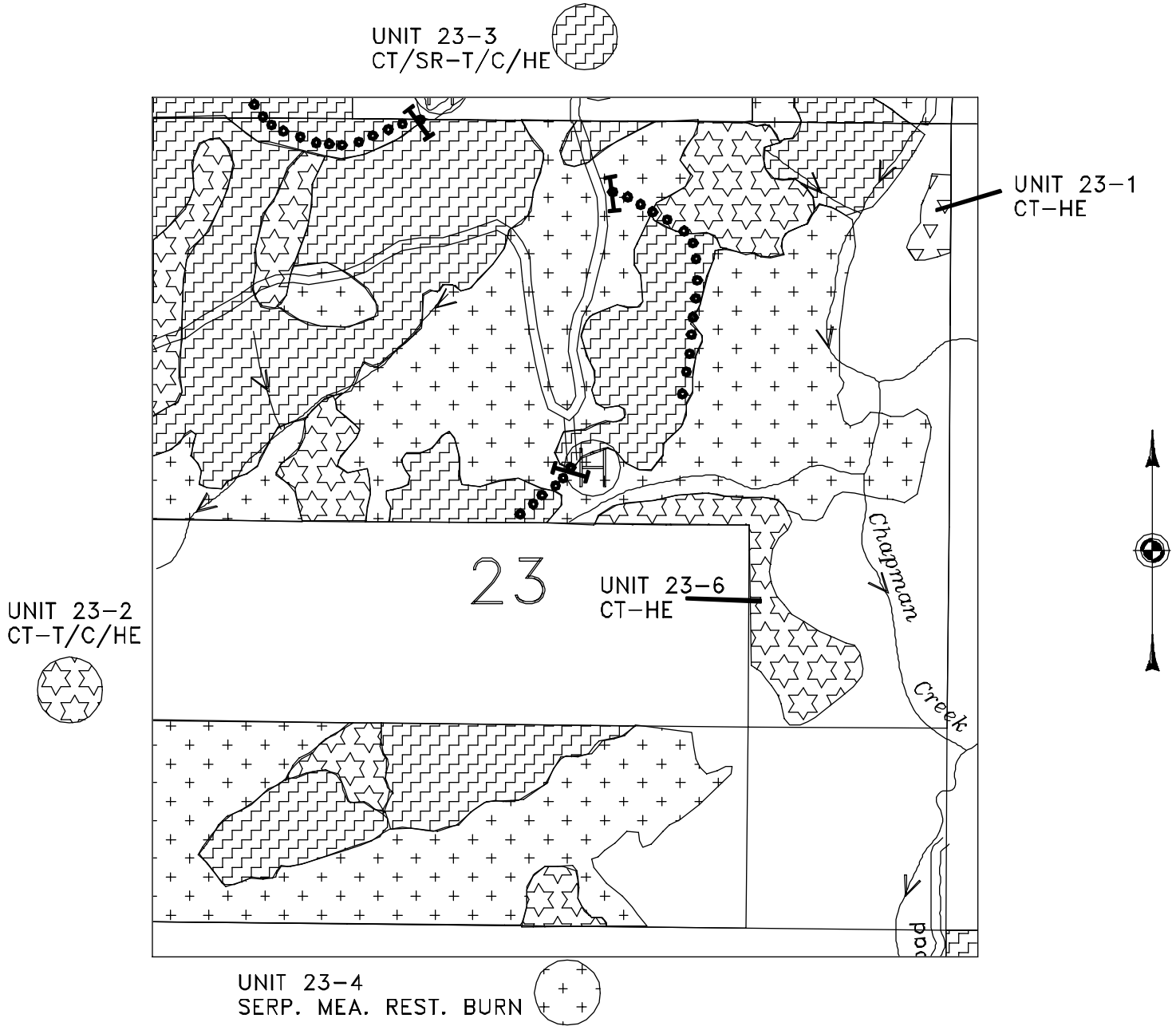
U.S.D.I. BLM MEDFORD DISTRICT SALE NO. 98-03
T.39S., R.8W., SEC. 17, WILL. MER.
FREE & EASY 2 FOREST MANAGEMENT PROJECT

MAP 2
ENVIRONMENTAL ASSESSMENT MAP



U.S.D.I. BLM MEDFORD DISTRICT
T.39S., R.8W., SEC. 23, WILL. MER.
FREE & EASY 2 FOREST MANAGEMENT PROJECT

MAP 2
ENVIRONMENTAL ASSESSMENT MAP
PAGE 5 OF 8

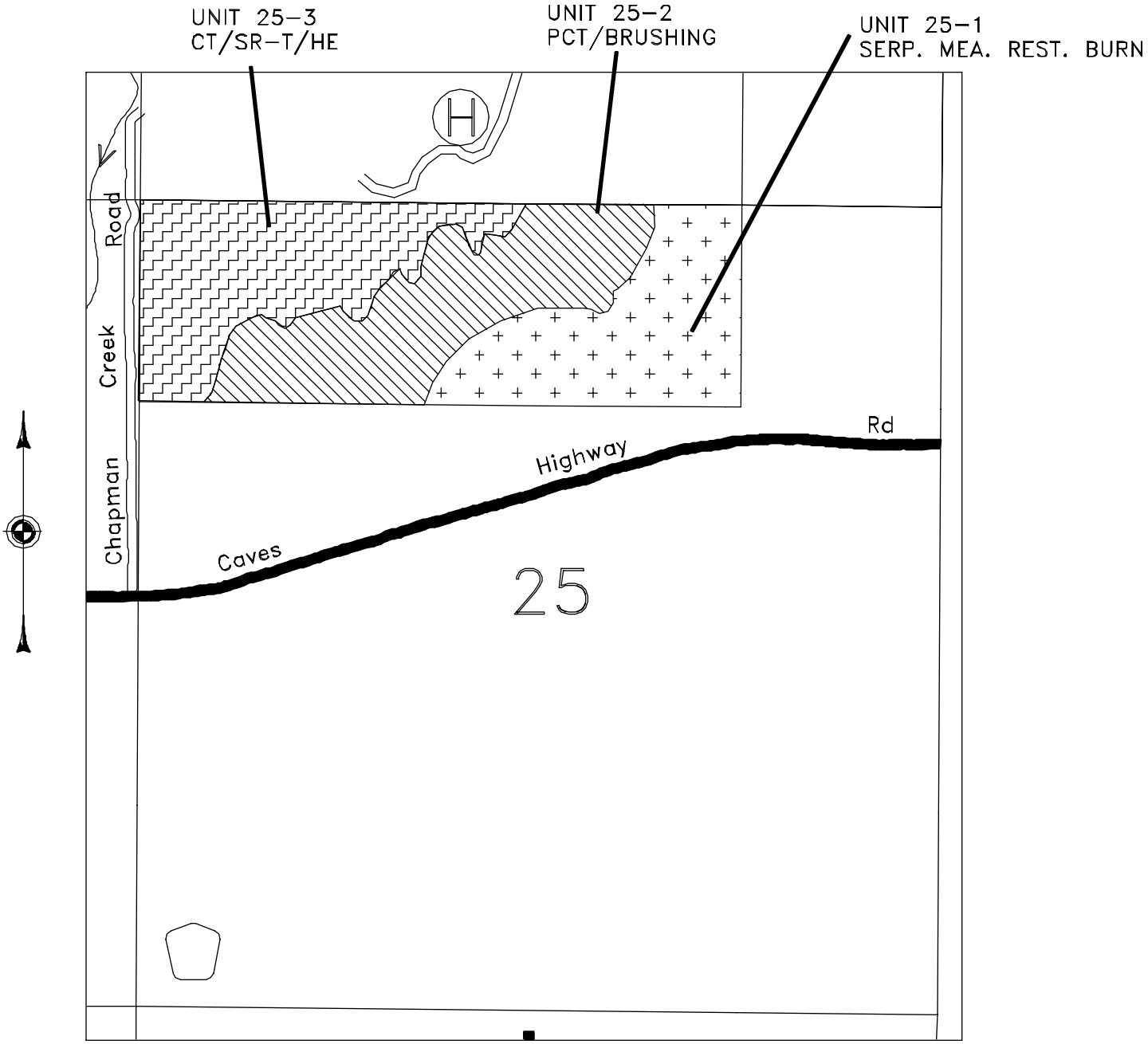


CONTOUR INTERVAL 100'

0 1000 2000
Feet

U.S.D.I. BLM MEDFORD DISTRICT
T.39S., R.8W., SEC. 25, WILL. MER.
FREE & EASY 2 FOREST MANAGEMENT PROJECT

MAP 2
ENVIRONMENTAL ASSESSMENT MAP
PAGE 6 OF 8

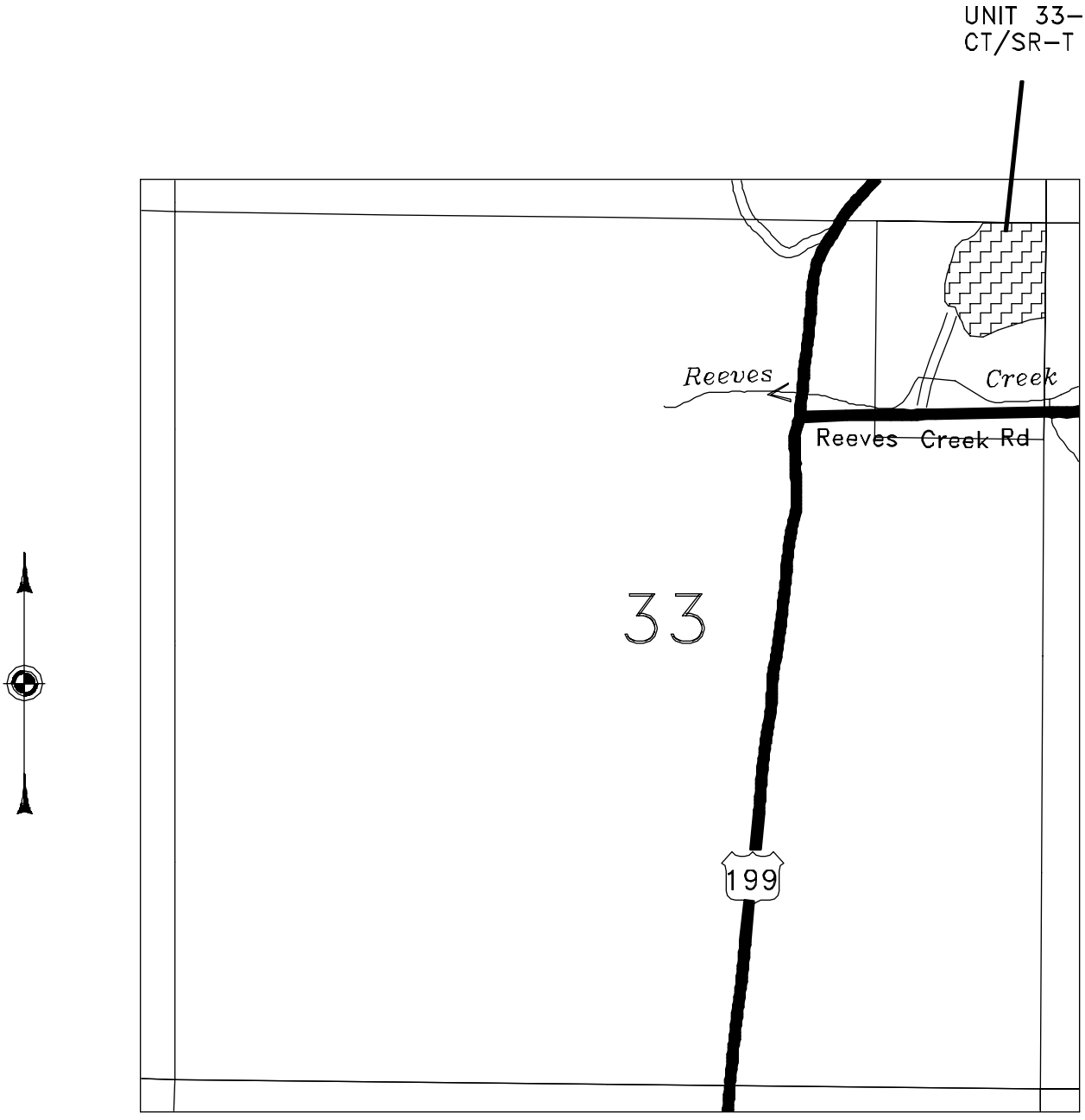


CONTOUR INTERVAL 100'

0 1000 2000
Feet

U.S.D.I. BLM MEDFORD DISTRICT
T.38S., R8W., SEC. 33, WILL. MER.
FREE & EASY 2 FOREST MANAGEMENT PROJECT

MAP 2
ENVIRONMENTAL ASSESSMENT MAP
PAGE 7 OF 8



CONTOUR INTERVAL 100'

0 1000 2000
Feet

U.S.D.I. BLM MEDFORD DISTRICT
T.39S., R.8W., SEC. 11, 14, 15, 17, 23, AND 25, WILL. MER.
T.38S., R.8W., SEC. 33, WILL. MER.
FREE & EASY 2 FOREST MANAGEMENT PROJECT

MAP 2
ENVIRONMENTAL ASSESSMENT MAP
PAGE 8 OF 8

LEGEND

EXISTING ROAD

PAVED ROAD

SPUR TO BE CONSTRUCTED

STREAM

O&C BLM LAND

PVT PRIVATE LAND

PD BLM LAND

EXISTING GATE

EARTH/LOG BARRICADE TO BE CONSTRUCTED

POTENTIAL HELICOPTER LANDING

PRE-COMMERCIAL THIN/BRUSHING

COMMERCIAL THIN

SHELTERWOOD RETENTION

COMMERCIAL THIN/SHELTERWOOD RETENTION

SERPENTINE MEADOW RESTORATION BURN

OAK RESTORATION

Appendix B: Summary of Proposed Treatments

Table B-1: Summary Description of the Proposed Action

T-R-SEC	Project Unit # OI No.	Land Alloc. (NFP)	TPCC	Unit Acres	Seral Stage		Silv. / Harvest Prescription	DBH Range		Logging Systems	Slash Treatment -- Understory Treatment	Non-harvest understory treatment (Ac).	Unit Timber vol. (MBF / ac) (Est)	Harvest Volume (est) MBF			Comments
					Current	Post Harvest		Stand (in)	Harvest (in)					Harv./ Treat. Acres	Vol / Ac	Total	
T39S, R8W Section 11																	
39-8-11	11-2 (001,003, 004)	Matrix	RTR FGR	68	Mid	Mid/Mature	CT / SR	8-24	8-24	He	SS,HP/B,L&S		31	68	3	204	
39-8-11	11-4 (006)	Matrix	RMR	14	Mature	Mature	CT	8-30	8-24	He	None		29	14	3	42	
T39S, R8W Section 14																	
39-8-14	14-1 (002)	Matrix	RMR	14	Mature	Mature	CT / SR	8-28	8-28	T / C He	HP/B, SS, UB		43	14	6	84	
39-8-14	14-2 (003,007,008)	Matrix	RMR	20	Mature	Mature	CT	8-28	8-28	T / C He	HP/B, SS, UB		27	20	4	80	
39-8-14	14-4 (004)	Matrix	RTR	18	Mature	Mature	CT / SR	8-28	8-28	T / C He	L&S, UB, GR		35	18	3	54	
39-8-14	14-5 (003,007)	Matrix	RTW LSW	5	Mature	Mature	Oak Woodland Restoration	8-24	8-24	C/He	HP/B, SS, UB		5	5	2	10	
39-8-14	14-6 (005, 007)	Matrix	LSW	33	Grass Brush	Grass	Serpentine Meadow Restor. Burn					33	N/A	0	N/A	N/A	
T39S, R8W Section 15																	
39-8-15	15-3 (004,003)	Matrix	RTR	16	Mature	Mature	CT	8-24	8-24	T / He	SS, UB.		32	16	5	80	
39-8-15	15-4 (004,005)	Matrix	RTR	77	Mature	Mature	CT / SR	8-32	8-32	T / He	SS, L&S,GR HP/B		25	77	3	231	
T39S, R8W Section 17																	
39-8-17	17-3 (002)	Matrix	RTR	28	Mature	Mature	CT / SR, Manzanita Harvest	8-24	8-24	T	SS,HP/B, girdle unreserved hardwoods 6-12" dbh, L&S		20	23	5	115	Approx. 5 acres in east-Manzanita Harvest (Special Forest Product)
T39S, R8W Section 23																	
39-8-23	23-1 (001)	Matrix	FNR/ RTR	5	Mature	Mature	CT	8-24	8-24	He	None		20	5	8	40	

Table B-1: Summary Description of the Proposed Action

T-R-SEC	Project Unit # OI No.	Land Alloc. (NFP)	TPCC	Unit Acres	Seral Stage		Silv. / Harvest Prescription	DBH Range		Logging Systems	Slash Treatment -- Understory Treatment	Non-harvest understory treatment (Ac).	Unit Timber vol. (MBF / ac) (Est)	Harvest Volume (est) MBF			Comments
					Current	Post Harvest		Stand (in)	Harvest (in)					Harv./ Treat. Acres	Vol / Ac	Total	
39-8-23	23-2 (see footnote 3)	Matrix	RTR/ RMW LSW	39	Mature	Mature	CT	8-28	8-28	T/C He	SS, L&S, UB in matrix		18	39	4	156	
39-8-23	23-3 (see footnote 4)	Matrix	RTR RMW LSW	112	Mature	Mature	CT / SR PCT/Brushing	8-26	8-26	T/C He	SS, L&S, UB Hp/B		18	112	4	448	
39-8-23	23-4 (see footnote 5)	Matrix	LSW	159	Grass/ Brush	Grass/ Brush	Serp. Meadow / Chaparral Restor. Burn			N/A	UB	159	N/A	0	N/A	N/A	
39-8-23	23-6 (006)	Matrix	FNR/ RTR	15	Mature	Mature	CT	8-24	8-24	He	L&S		20	15	8	120	
T39S, R8W Section 25																	
39-8-25	25-1 (001)	Matrix	LSW	42	Grass/ Brush	Grass/ Brush	Serpentine Meadow Restor. Burn			N/A	UB	42	N/A	0	N/A	N/A	
39-8-25	25-2 (002)	Matrix	RTW	38	Early/ Mid	Early/ Mid	PCT/ Brushing			N/A	SS,HP/B, UB,	38		0	N/A		
39-8-25	25-3 (003)	Matrix	RTR	40	Mature	Mature	CT/SR	8-24	8-24	T/He	SS,HP/B, UB, GR		30	40	4	160	
T38S, R8W Section33																	
38-8-33	33-1 (001)	Matrix	RTR	8	Mature	Mature/ Early	CT / SR	8-24	8-24	T	SS,HP/B		20	8	5	40	
TOTAL :				**749**								**269**		**474**		**1,864**	

Table B-1: Summary Description of the Proposed Action

T-R-SEC	Project Unit # OI No.	Land Alloc. (NFP)	TPCC	Unit Acres	Seral Stage		Silv. / Harvest Prescription	DBH Range		Logging Systems	Slash Treatment -- Understory Treatment	Non-harvest understory treatment (Ac).	Unit Timber vol. (MBF / ac) (Est)	Harvest Volume (est) MBF			Comments
					Current	Post Harvest		Stand (in)	Harvest (in)					Harv./ Treat. Acres	Vol / Ac	Total	

Footnotes:

1) TPCC (Timber Productivity Capability Classification): RTR - regeneration restricted due to hot temperatures and low soil moisture; RMR- regeneration restricted due to low soil moisture. FNR-fragile nutrient restricted; LSW- low site withdrawn; RMW-restricted moisture withdrawn

2) Stand Successional Stage:

Early - Vegetation is dominated by shrubs or conifers and hardwood trees in a seedling/ sapling size class (<5"DBH)

Mid - Vegetation is tree dominated. Trees at least small pole size (>4"DBH). Larger scattered trees may be present.

Mature - Forest has begun to differentiate into distinct canopy layers. Overstory dominant and codominant trees are conifers greater than 20" DBH, understory trees will be conifer-hardwood mix.

Harvest acres vs. Unit acres: The difference in these acreages is attributable to large variability within the unit, unit inclusions of riparian reserves, non-forest, etc.

3) Unit 23-2 (T.39S-8-W) includes OI Units 002, 005, 008, 009, and silvicultural prescription units 1,4,6,9,15, 19

4) Unit 23-3 (T.39S-8-W) includes OI Units 002, 003, 005, 009, and silvicultural prescription units 2,3,5,7,8,10, 11, 12, 13, 14, 16, 17, 18, 21

5) Unit 23-4 (T.39S-8-W) includes OI Units 003, 008, 010, 011

6) Proposed silvicultural prescription: CT - Commercial thin, SR - Structural retention, PCT - Precommercial thinning,

7) Logging systems: T-Tractor, He-Helicopter, C-Cable

8) Slash treatment/Understory treatment- SS-Selective slashing, UB- Underburn, HP/B- Handpile and burn, L&S- Lop and scatter, GR-girdle madrone 6-12"DBH

Appendix C: Proposed Road Use / Work

Table C-1: Proposed Road Use, Construction, Renovation, Improvement, Maintenance and closure

Road Number/ Road Segment	Road Control by	Total Length (miles)	Current Condition / Surface type	Miles of Proposed Treatment:				Proposed Action	Proposed Closures and Decommissioning
				Maint.	Const.	Renovation	Decommis.		
39-8-3	BLM	2.50	PRR	2.50				Maintenance	
39-8-4A	BLM	1.33	BST	1.33				Maintenance	
39-7-19A	BLM	1.50	ASC	1.50				Maintenance	
38-8-33	BLM	0.10	NAT	0.10	0.10		0.10	Install temporary culvert across Reeves Creek	Remove culvert after unit has been treated
39-8-23	BLM	2.00	NAT	2.00		2.00		Install culverts, drainage dips, spot rock, brush and grade road	Install standard BLM gate at beginning of road.
Section 23 3 Temp Spurs	BLM	1.00	NAT		1.00		1.00	Construct 3 temporary spur roads	Decommission 3 temporary spur roads after burning/site prep is completed.
Private road Section 14	Rough & Ready	1.40	NAT	1.40		1.40		Install culverts, drainage dips, spot rock, brush and grade road	
Section 14 Temp Spur	BLM	0.40	NAT		0.40		0.40	Construct temporary spur road	Decommission temporary spur road following treatment
Section 14 Temp Spur	Rough & Ready	0.30	NAT		0.30		0.30	Construct temporary spur road	Decommission temporary spur road following treatment
Private road Section 24	Rough & Ready	1.30	NAT	1.30					
Section 17 Temp Spur	BLM	0.10	NAT		0.10		0.10	Construct temporary spur road	Decommission temporary spur road following treatment
TOTALS		**11.93**		**10.13**	**1.9**	**3.4**	**1.9**		

NAT =Natural Surface; PRR =Pit Run Rock; ABC =Aggregate Base Coarse; ASC =Aggregate Surface Coarse; BST =Bituminous Surface Treatment

Maintenance consists of surface blading, roadside brushing for safety, spot rocking and maintaining existing drainage structures. Maintenance of natural surface roads also includes correcting drainage and erosion problems (*e.g.*, improving or installing water dips, installing other drainage structures where needed, eliminating outside road edge berms or other features that are obstructing drainage). Maintenance could occur before, during and/or after road use that occurs as a part of the project.

Renovation consists of reconditioning and preparing the subgrade for heavy truck use, cleaning and shaping drainage ditches and structures, and trimming or removing vegetation from cut and embankment slopes.

Full *decommissioning* consists of subsoil ripping of the roadbed to promote the establishment of vegetation and promote drainage consistent with the surrounding undisturbed areas. Existing culverts will be removed during full decommissioning to restore a natural hydrologic flow.

Appendix D: Fire Management Planning: Hazard, Risk, and Value at Risk Rating Classification Method and Assumptions

A. Fuel Hazard Rating

A fuel hazard rating classifies the potential wildfire impacts to the resources present on a given site. It is based on the condition of the live vegetation and dead and down fuels present at the time of classification. It is based on weather and fire behavior conditions at the High to Extreme Fire Danger index used by Oregon Department Of Forestry and Federal agencies.

A HIGH classification would be an area that has the potential to experience high to extreme burn intensities that would result in stand replacement or a very high percentage of mortality to the vegetation present. Fire suppression would be difficult and complex, with a high degree of resistance to control, and a high potential for a fire size to exceed 100 acres, and require multiple burning periods to control.

A MODERATE classification would be an area that has the potential to have a mosaic of intensities occur. Areas of total stand replacement can occur but this would not be expected on all the burn area. Fire suppression would be difficult but resistance to control is not as great or complex. Fire size potentially could be kept below 100 acres and control could be expected in several burning periods or less.

A LOW classification would be an area that has the potential to have the majority of the area burn at lower fire intensities. Areas of total stand replacement can occur but would be limited to small areas and be low in number. Fire suppression would not be expected to be difficult and resistance to control is not great or complex. Fire size potentially could be as large as the fuel is continuous, but control could be expected in one to two burning periods.

Hazard rating is based on the summation total points assigned based on six elements as follows:

1)	Slope	Percent	Points
		0-19	5
		20-44	10
		45+	25
2)	Aspect	Degree	Points
		316-360, 0-67	5
		68-134, 294-315	10
		135-293	15
3)	Position On Slope		Points
		Upper 1/3	5
		Mid-Slope	10
		Lower 1/3	25
4)	Fuel Model	Model	Points
		Grass 1, 2, 3	5
		Timber 8	5
		Shrub 5	10
		Timber 9	15
		Shrub 6	20
		Timber 10	20
		Slash 11	25

Shrub 4	30
Slash 12, 13	30

5) Ladder Fuel Presence (Use when forest vegetation has DBH of 5" or greater (vegetation condition class 6). Exceptions are possible based on stand conditions.

Fuel ladder conditions	Points
Ladder fuel absent.	0
Present on less than 1/3 percent of area; vertical continuity can be either less or greater than 50%.	5
Present on 1/3 to 2/3 percent of area; vertical continuity is less than 50%.	15
Present on 1/3 to 2/3 percent of area; vertical continuity is greater than 50%.	25
Present on greater than 2/3 percent of area; vertical continuity is less than 50%.	30
Present on greater than 2/3 percent of area; vertical continuity is greater than 50%.	40

6) Hazard Summation / Rating

POINTS	HAZARD RATING
0-45	LOW
50-70	MODERATE
75-135	HIGH

B. Risk Rating

Risk is the source of wildfire ignition, both human and lightning. Rating is based on the presence, availability, and amount of ignition sources.

HIGH Rating when human population areas are present on or adjacent within 1/4 mile of the area; area has good access with many roads; relatively higher incidence of lightning occurrence; area has high level of human use.

MODERATE Rating when area has human access and experiences informal use; area is used during summer and fall seasons as main travel route or for infrequent recreational activities. Lightning occurrence is typical for the area and not notably higher.

LOW Rating when area has limited human access and infrequent use. Baseline as standard risk, mainly from lightning occurrence with only rare risk of human fire cause.

C. Value At Risk

A relative assignment of value based on expected "loss" due to adverse wildfire effects. Assigned through interdisciplinary process. Based on human and resource values within planning area. Can be based on land allocations, special use areas, human improvements/monetary investment, residential areas, agricultural use, structures present, soils, vegetation conditions, and habitat.

Examples:

HIGH RATING - ACEC, RNA, LSR, wilderness, Special Status species present, critical habitats, recreation area, residential areas, farming, vegetation condition such as late successional forest (McKelvey ratings of 81, 82, 71, 72; vegetation condition of 4 and 5), caves, cultural, or monetary investment present. Riparian areas.

MODERATE RATING - Granitic soils, informal recreation areas and trails. Vegetation with potential to meet late successional forest conditions within the next 20 to 40 years or less (Vegetation and McKelvey rating 85, 75, 65).

LOW RATING - Vegetation in younger conditions that will not meet late successional conditions for 40 or more years (Vegetation condition class 1, 2, 3; and vegetation 5, 6, 7 with McKelvey rating 4).

D. Fuel Model

Based on the Fuel Models used to predict wildfire behavior as described in "Aids to Determining Fuel Models For Estimating Fire Behavior", Hal E. Anderson, General Technical Report INT-122, April 1982, published by National Wildfire Coordination Group. The 13 models categorize and group vegetation based on similar expected fire behavior. These models are the national standard for fire behavior predictions used in fire and resource planning.

Appendix E: Potential Monitoring

1. All previously tractor yarded units that are harvested by tractor under this proposal would be evaluated post-harvest to determine area extent of compaction. The goal is to result in 12% or less compacted area.

2. Continue to monitor and evaluate the effects of prescribed fire on Special Status plant species.

Appendix F: Alternatives Considered but Eliminated

1. PCT / Brushing of 20 acres within the riparian reserve allocation.

2. Construction of a road in Section 15 to access a potential helicopter landing in Unit 15-4. This was not pursued because it would have entailed construction through a wet meadow and because it would have had direct impacts on areas where populations of *Limnanthes gracilis var. gracilis* exist. It will result in more costly logging.

3. Vegetation treatments in Free & Easy Creek drainage were considered in the initial planning of the Free and Easy project. These were deferred when an bald eagle nest was located nearby along the Illinois River.

Appendix G: Acronyms and Glossary of Terms

I. Acronyms/Abbreviations

AMA	-	Adaptive Management Area
CT	-	Commercial thinning
CWD	-	Coarse Woody Debris
DBH	-	Diameter at breast height
GFMA	-	General Forest Management Area
GS	-	Group Selection
IDT	-	Interdisciplinary team
LSR(s)	-	Late Successional Reserve(s)
LUA	-	Land Use Allocation
MBF	-	Thousand Board Feet
NEPA	-	National Environmental Policy Act
OI	-	Operations Inventory
PCT	-	Precommercial thinning
RMP	-	Resource Management Plan
ROD	-	Record of Decision
SFP(s)	-	Special Forest Product(s)
T&E	-	Threatened and Endangered (species)
TPCC	-	Timber Production Capability Classification
VRM	-	Visual Resource Management

II. Glossary (From Medford District RMP)

Age Class - One of the intervals into which the age range of trees is divided for classification or use.

Allowable Sale Quantity (ASQ) - The gross amount of timber volume, including salvage, that may be sold annually from a specified area over a stated period of time in accordance with the management plan. Formerly referred to as "allowable cut."

Anadromous Fish - Fish that are born and reared in freshwater, move to the ocean to grow and mature, and return to freshwater to reproduce. Salmon, steelhead, and shad are examples.

Aquatic Ecosystem - Any body of water, such as a stream, lake, or estuary, and all organisms and nonliving components within it, functioning as a natural system.

Aquatic Habitat - Habitat that occurs in free water.

Biological Diversity - The variety of life and its processes.

Bureau Assessment Species - Plant and animal species on List 2 of the Oregon Natural Heritage Data Base, or those species on the Oregon List of Sensitive Wildlife Species (OAR 635-100-040), which are identified in BLM Instruction Memo No. OR-91-57, and are not included as federal candidate, state listed or Bureau sensitive species.

Bureau Sensitive Species - Plant or animal species eligible for federal listed, federal candidate, state listed, or state candidate (plant) status, or on List 1 in the Oregon Natural Heritage Data Base, or approved for this category by the State Director.

Candidate Species - Those plants and animals included in Federal Register "Notices of Review" that are being considered by the Fish and Wildlife Service (FWS) for listing as threatened or endangered. There are two categories that are of primary concern to BLM. These are:

Category 1. Taxa for which the Fish and Wildlife Service has substantial information on hand to support proposing the species for listing as threatened or endangered. Listing proposals are either being prepared or have been delayed by higher priority listing work.

Category 2. Taxa for which the Fish and Wildlife Service has information to indicate that listing is possibly appropriate. Additional information is being collected.

Canopy - The more or less continuous cover of branches and foliage formed collectively by adjacent trees and other woody species in a forest stand. Where significant height differences occur between trees within a stand, formation of a multiple canopy (multi-layered) condition can result.

Climax Plant Community - The theoretical, final stable, self-sustaining, and self reproducing state of plant community development that culminates plant succession on any given site. Given a long period of time between disturbances, plant associations on similar sites under similar climatic conditions approach the same species mixture and structure. Under natural conditions, disturbance events of various intensities and frequencies result in succession usually culminating as sub-climax with the theoretical end point occurring rarely of at all.

Coarse Woody Debris - Portion of tree that has fallen or been cut and left in the woods. Usually refers to pieces at least 20 inches in diameter. FEMAT

Commercial Thinning - The removal of merchantable trees from an even-aged stand to encourage growth of the remaining trees.

Connectivity - A measure of the extent to which conditions between late-successional/old-growth forest areas provide habitat for breeding, feeding, dispersal, and movement of late-successional/old-growth-associated wildlife and fish species.

Cover - Vegetation used by wildlife for protection from predators, or to mitigate weather conditions, or to reproduce. May also refer to the protection of the soil and the shading provided to herbs and forbs by vegetation.

Critical Habitat - Under the Endangered Species Act, (1) the specific areas within the geographic area occupied by a federally listed species on which are found physical and biological features essential to the conservation of the species, and that may require special management considerations or protection; and (2) specific areas outside the geographic area occupied by a listed species when it is determined that such areas are essential for the conservation of the species.

Cultural Resource - Any definite location of past human activity identifiable through field survey, historical documentation, or oral evidence; includes archaeological or architectural sites, structures, or places, and places of traditional cultural or religious importance to specified groups whether or not represented by physical remains.

Cultural Site - Any location that includes prehistoric and/or historic evidence of human use or that has important sociocultural value.

Cumulative Effect - The impact which results from identified actions when they are added to other past, present, and reasonably foreseeable future actions regardless of who undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Density Management - Cutting of trees for the primary purpose of widening their spacing so that growth of remaining trees can be accelerated. Density management harvest can also be used to improve forest health, to open the forest canopy, or to accelerate the attainment of old growth characteristics if maintenance or restoration of biological diversity is the objective.

Designated Area - An area identified in the Oregon Smoke Management Plan as a principal population center requiring protection under state air quality laws or regulations.

Diameter At Breast Height (DBH) - The diameter of a tree 4.5 feet above the ground on the uphill side of the tree.

Ecosystem Diversity - The variety of species and ecological processes that occur in different physical settings.

Ecosystem Management - The management of lands and their resources to meet objectives based on their whole ecosystem function rather than on their character in isolation. Management objectives blend long-term needs of people and environmental values in such a way that the lands will support diverse, healthy, productive and sustainable ecosystems.

Endangered Species - Any species defined through the Endangered Species Act as being in danger of extinction throughout all or a significant portion of its range and published in the Federal Register.

Environmental Assessment (EA) - A systematic analysis of site-specific BLM activities used to determine whether such activities have a significant effect on the quality of the human environment and whether a formal environmental impact statement is required; and to aid an agency*s compliance with National Environmental Protection Agency when no Environmental Impact Statement is necessary.

Environmental Impact - The positive or negative effect of any action upon a given area or resource.

Ephemeral Stream - Streams that contain running water only sporadically, such as during and following storm events.

Forest Canopy - The cover of branches and foliage formed collectively by the crowns of adjacent trees and other woody growth.

Forest Health - The ability of forest ecosystems to remain productive, resilient, and stable over time and to withstand the effects of periodic natural or human-caused stresses such as drought, insect attack, disease, climatic changes, flood, resource management practices and resource demands.

Forest Land - Land that is now, or is capable of becoming, at least ten percent stocked with forest trees and that has not been developed for nontimber use.

Forest Succession - The orderly process of change in a forest as one plant community or stand condition is replaced by another, evolving towards the climax type of vegetation.

General Forest Management Area - Forest land managed on a regeneration harvest cycle of 70-110 years. A biological legacy of six to eight green trees per acre would be retained to assure forest health. Commercial thinning would be applied where practicable and where research indicates there would be gains in timber production.

Genetic Diversity - The variety within populations of a species.

Habitat Diversity - The number of different types of habitat within a given area.

Historic Site - A cultural resource resulting from activities or events dating to the historic period (generally post AD l830 in western Oregon).

Impact - A spatial or temporal change in the environment caused by human activity.

Intact Old Growth Habitat - Older fores types that have not been entered for logging or are lightly entered such that structural and functional characteristics of the forest are essentially unchanged, except in relation to the size of the habitat island, Typically, forests of coniferous series with crown closure above 70 percent. Also includes low site lands lacking the ecological potential to produce older forest habitat characteristics.

Intermittent Stream - Any nonpermanent flowing drainage feature having a definable channel and evidence of scour or deposition. This includes what are sometimes referred to as ephemeral streams if they meet these two criteria.

Land Use Allocations - Allocations which define allowable uses/activities, restricted uses/activities, and prohibited uses/activities. They may be expressed in terms of area such as acres or miles etc. Each allocation is associated with a specific management objective.

Landing - Any place on or adjacent to the logging site where logs are assembled for further transport.

Landscape Diversity - The size, shape and connectivity of different ecosystems across a large area.

Landscape Ecology - Principles and theories for understanding the structure, functioning, and change of landscapes over time. Specifically it considers (1) the development and dynamics of spatial heterogeneity, (2) interactions and exchanges across heterogeneous landscapes, (3) the influences of spatial heterogeneity on biotic and abiotic processes, and (4) the management of spatial heterogeneity. The consideration of spatial patterns distinguishes landscape ecology from traditional ecological studies, which frequently assume that systems are spatially homogeneous.

Landscape Pattern - The number, frequency, size, and juxtaposition of landscape elements (patches) which are important to the determination or interpretation of ecological processes.

Late-Successional Forests - Forest seral stages which include mature and old-growth age classes.

Late-Successional Reserve - A forest in its mature and/or old-growth stages that has been reserved.

Log Decomposition Class - Any of five stages of deterioration of logs in the forest; stages range from essentially sound (class 1) to almost total decomposition (class 5).

Long-Term - The period starting ten years following implementation of the Resource Management Plan. For most analyses, long-term impacts are defined as those existing 100 years after implementation.

Long-Term Soil Productivity - The capability of soil to sustain inherent, natural growth potential of plants and plant communities over time.

Matrix Lands - Federal land outside of reserves and special management areas that will be available for timber harvest at varying levels.

Mature Stand - A mappable stand of trees for which the annual net rate of growth has peaked. Stands are generally greater than 80-100 years old and less than 180-200 years old. Stand age, diameter of dominant trees, and stand structure at maturity vary by forest cover types and local site conditions. Mature stands generally contain trees with a small average diameter, less age class variation, and less structural complexity than old-growth stands of the same forest type. Mature stages of some forest types are suitable habitat for spotted owls. However, mature forests are not always spotted owl habitat, and spotted owl habitat is not always mature forest.

Mining Claims - Portions of public lands claimed for possession of locatable mineral deposits, by locating and recording under established rules and pursuant to the 1872 Mining Law.

Mitigating Measures - Modifications of actions which (a) avoid impacts by not taking a certain action or parts of an action; (b) minimize impacts by limiting the degree or magnitude of the action and its implementation; (c) rectify impacts by repairing, rehabilitating or restoring the affected environment; (d) reduce or eliminate impacts over time by preservation and maintenance operations during the life of the action; or (e) compensate for impacts by replacing or providing substitute resources or environments.

Monitoring - The process of collecting information to evaluate if objectives and anticipated or assumed results of a management plan are being realized or if implementation is proceeding as planned.

Multi-aged Stand - A forest stand which has more than one distinct age class arising from specific disturbance and regeneration events at various times. These stands normally will have multi-layered structure.

Multi-layered Canopy - Forest stands with two or more distinct tree layers in the canopy; also called multi-storied stands.

Multiple Use - Management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people. The use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife, fish, and natural scenic, scientific and historical values.

Mycorrhiza - underground fungi that provide a close physical association between the fungus and the roots of a plant, from which both the fungus and plant appear to benefit. A mycorrhizal root takes up nutrients more efficiently than one not associated with mycorrhiza. Mycorrhizal fungi (also known as ectomycorrhizal) are essential for host plant nutrient uptake and play important roles in nutrient cycling in many forests. Studies from the Pacific Northwest indicate that forest management activities can reduce populations of mycorrhizal fungi and forest regeneration success (Luoma, Eberhart, Amaranthus 1997).

Neotropical migrants - a wide variety of bird species, which breed in temperate North America but migrate to tropical habitats in Central and South America during winter.

Noncommercial Forest Land - Land incapable of yielding at least 20 cubic feet of wood per acre per year of commercial species; or land which is capable of producing only noncommercial tree species.

Noncommercial Tree Species - Minor conifer and hardwood species whose yields are not reflected in the commercial conifer forest land ASQ. Some species may be managed and sold under a suitable woodland ASQ and, therefore, may be commercial as a woodland species.

Nonforest Land - Land developed for nontimber uses or land incapable of being ten percent stocked with forest trees.

Noxious Plant - A plant specified by law as being especially undesirable, troublesome, and difficult to control.

O&C Lands - Public lands granted to the Oregon and California Railroad Company and subsequently revested to the United States.

Off Highway Vehicle (OHV) - Any motorized vehicle capable of, or designed for, travel on land, water, or natural terrain. The term “Off Highway Vehicle” will be used in place of the term “Off Road Vehicle” to comply with the Purposes of Executive Orders 11644 and 11989. The definition for both terms is the same.

Old-Growth Conifer Stand - Older forests occurring on western hemlock, mixed conifer, or mixed evergreen sites which differ significantly from younger forests in structure, ecological function, and species composition. Old growth characteristics begin to appear in unmanaged forests at 175-250 years of age. These characteristics include (a) a patchy, multi-layered canopy with trees of several age classes; (b) the presence of large living trees; (c) the presence of larger standing dead trees (snags) and down woody debris, and (d) the presence of species and functional processes which are representative of the potential natural community.

For purposes of inventory, old-growth stands on BLM-administered lands are only identified if they are at least ten percent stocked with trees of 200 years or older and are ten acres or more in size. For purposes of habitat or biological diversity, the BLM uses the appropriate minimum and average definitions provided by Pacific Northwest Experiment Station publications 447 and GTR-285. This definition is summarized from the 1986 interim definitions of the Old-Growth Definitions Task Group.

Old-Growth Forest - A forest stand usually at least 180-220 years old with moderate high canopy closure; a multilayered, multi species canopy dominated by large overstory trees; high incidence of large trees, some with broken tops and other indications of old and decaying wood (decadence); numerous large snags; and heavy accumulations of wood, including large logs on the ground.

Old-Growth-Dependent Species - An animal species so adapted that it exists primarily in old growth forests or is dependent on certain attributes provided in older forests.

Operations Inventory Unit - An aggregation of trees occupying an area that is sufficiently uniform in composition, age, arrangement and condition to be distinguishable from vegetation on adjoining areas.

Optimal Cover - For elk, cover used to hide from predators and avoid disturbances, including man. It consists of a forest stand with four layers and an overstory canopy which can intercept and hold a

substantial amount of snow, yet has dispersed, small openings. It is generally achieved when the dominant trees average 21 inches DBH or greater and have 70 percent or greater crown closure.

Overstory - That portion of trees which form the uppermost layer in a forest stand which consists of more than one distinct layer (canopy).

Partial Cutting - Removal of selected trees from a forest stand.

Peak Flow - The highest amount of stream or river flow occurring in a year or from a single storm event.

Perennial Stream - A stream that has running water on a year-round basis under normal climatic conditions.

Planning Area - All of the lands within the BLM management boundary addressed in a BLM resource management plan; however, BLM planning decisions apply only to BLM-administered lands and mineral estate.

Plant Association - A plant community type based on land management potential, successional patterns, and species composition.

Plant Community - An association of plants of various species found growing together in different areas with similar site characteristics.

Precommercial Thinning - The practice of removing some of the trees less than merchantable size from a stand so that remaining trees will grow faster.

Prescribed Fire - A fire burning under specified conditions that will accomplish certain planned objectives.

Priority Habitats - Aquatic, wetland and riparian habitats, and habitats of priority animal taxa.

Probable Sale Quantity (PSQ) - Probable sale quantity estimates the allowable harvest levels for the various alternatives that could be maintained without decline over the long term if the schedule of harvests and regeneration were followed. "Allowable" was changed to "probable" to reflect uncertainty in the calculations for some alternatives. Probable sale quantity is otherwise comparable to allowable sale quantity (ASQ). However, probable sale quantity does not reflect a commitment to a specific cut level. Probable sale quantity includes only scheduled or regulated yields and does not include "other wood" or volume of cull and other products that are not normally part of allowable sale quantity calculations.

Proposed Threatened or Endangered Species - Plant or animal species proposed by the U.S. Fish & Wildlife Service or National Marine Fisheries Service to be biologically appropriate for listing as threatened or endangered, and published in the Federal Register. It is not a final designation.

Public Domain Lands - Original holdings of the United States never granted or conveyed to other jurisdictions, or reacquired by exchange for other public domain lands.

Public Water System - A system providing piped water for public consumption. Such a system has at least fifteen service connections or regularly serves at least twenty-five individuals.

Reforestation - The natural or artificial restocking of an area with forest trees; most commonly used in reference to artificial stocking.

Regeneration Harvest - Timber harvest conducted with the partial objective of opening a forest stand to the point where favored tree species will be reestablished.

Resource Management Plan (RMP) - A land use plan prepared by the BLM under current regulations in accordance with the Federal Land Policy and Management Act.

Right-of-Way - A permit or an easement that authorizes the use of public lands for specified purposes, such as pipelines, roads, telephone lines, electric lines, reservoirs, and the lands covered by such an easement or permit.

Riparian Reserves - Designated riparian areas found outside Late-Successional Reserves.

Riparian Zone - Those terrestrial areas where the vegetation complex and microclimate conditions are products of the combined presence and influence of perennial and/or intermittent water, associated high water tables and soils which exhibit some wetness characteristics. Normally used to refer to the zone within which plants grow rooted in the water table of these rivers, streams, lakes, ponds, reservoirs, springs, marshes, seeps, bogs and wet meadows.

Ripping - The process of breaking up or loosening compacted soil to assure better penetration of roots, lower soil density, and increased microbial and invertebrate activity.

Road - A vehicle route which has been improved and maintained by mechanical means to ensure relatively regular and continuous use. A route maintained solely by the passage of vehicles does not constitute a road.

Rotation - The planned number of years between establishment of a forest stand and its regeneration harvest.

Rural Interface Areas - Areas where BLM-administered lands are adjacent to or intermingled with privately owned lands zoned for 1 to 20-acre lots or that already have residential development.

Sanitation-Salvage Cuttings - Combination of sanitation and salvage cuttings. In sanitation cuts trees either killer or injured by fire, insects, disease, etc., are removed for the purpose of preventing the spread of insect or disease. Salvage cut remove trees that are either filled or severely injured before merchantable material becomes unmerchantable.

Scarification - Mechanical removal of competing vegetation or interfering debris prior to planting.

Seral Stages - The series of relatively transitory plant communities that develop during ecological succession from bare ground to the climax stage. There are five stages:

Early Seral Stage - The period from disturbance to the time when crowns close and conifers or hardwoods dominate the site. Under the current forest management regime, the duration is approximately 0 to 10 years. This stage may be dominated by grasses and forbs or by sprouting brush or hardwoods. Conifers develop slowly at first and gradually replace grasses, forbs, or brush as the dominant vegetation. Forage may be present; hiding or thermal cover may not be present except in rapidly sprouting brush communities.

Mid-Seal Stage - The mid-seral stage occurs from crown closure to the time when conifers would begin to die from competition; approximately age 10 to 40. Stands are dense and dominated by conifers, hardwoods, or dense brush. Grass, forbs, and herbaceous vegetation decrease. Hiding cover for big game is usually present.

Late Seral Stage - Late seral stage occurs when conifers would begin to die from competition to the time when stand growth slows; approximately age 40 to 80. Forest stands are dominated by conifers or hardwoods; canopy closure often approaches 100 percent.

Stand diversity is minimal; conifer mortality rates and snag formation are rapid. Big game hiding and thermal cover is present. Forage and understory vegetation is minimal except in understocked stands or in meadow inclusions.

Mature Seral Stage - This stage exists from the point where stand growth slows to the time when the forest develops structural diversity; approximately age 80 to 200. Conifer and hardwood growth gradually decline. Developmental change slows. Larger trees increase significantly in size. Stand diversity gradually increases. Big game hiding cover, thermal cover, and some forage are present. With slowing growth, insect damage increases and stand breakup may begin on drier sites. Understory development is significant in response to openings in the canopy created by disease, insects, and windthrow. Vertical diversity increases. Larger snags are formed.

Old Growth - This stage constitutes the potential plant community capable of existing on a site given the frequency of natural disturbance events. For forest communities, this stage exists from approximately age 200 until when stand replacement occurs and secondary succession begins again. (Also see definitions of old-growth conifer stand and potential natural community.)

These definitions are used by BLM to separate age classes for analysis of impacts.

Short-Term - The period of time during which the RMP will be implemented; assumed to be ten years.

Silvicultural Prescription - A professional plan for controlling the establishment, composition, constitution and growth of forests.

Silvicultural System - A planned sequence of treatments over the entire life of a forest stand needed to meet management objectives.

Site Class - A measure of an area*s relative capacity for producing timber or other vegetation.

Site Index - A measure of forest productivity expressed as the height of the tallest trees in a stand at an index age.

Site Preparation - Any action taken in conjunction with a reforestation effort (natural or artificial) to create an environment which is favorable for survival of suitable trees during the first growing season. This environment can be created by altering ground cover, soil or microsite conditions, using biological, mechanical, or manual clearing, prescribed burns, herbicides or a combination of methods.

Skid Trail - A pathway created by dragging logs to a landing (gathering point).

Slash - The branches, bark, tops, cull logs, and broken or uprooted trees left on the ground after logging.

Smoke Management - Conducting a prescribed fire under suitable fuel moisture and meteorological conditions with firing techniques that keep smoke impact on the environment within designated limits.

Smoke Management Program - A program designed to ensure that smoke impacts on air quality from agricultural or forestry burning operations are minimized; that impacts do not exceed, or significantly contribute to, violations of air quality standards or visibility protection guidelines; and that necessary open burning can be accomplished to achieve land management goals.

Smoke Sensitive Area - An area identified by the Oregon Smoke Management Plan that may be negatively affected by smoke but is not classified as a designated area.

Snag - Any standing dead, partially-dead, or defective (cull) tree at least ten inches in diameter at breast height (DBH) and at least six feet tall. A hard snag is composed primarily of sound wood, generally merchantable. A soft snag is composed primarily of wood in advanced stages of decay and deterioration, generally not merchantable.

Snag Dependent Species - Birds and animals dependent on snags for nesting, roosting, or foraging habitat.

Soil Compaction - An increase in bulk density (weight per unit volume) and a decrease in soil porosity resulting from applied loads, vibration, or pressure.

Soil Displacement - The removal and horizontal movement of soil from one place to another by mechanical forces such as a blade.

Soil Productivity - Capacity or suitability of a soil for establishment and growth of a specified crop or plant species, primarily through nutrient availability.

Special Forest Products - Firewood, shake bolts, mushrooms, ferns, floral greens, berries, mosses, bark, grasses etc., that could be harvested in accordance with the objectives and guidelines in the proposed resource management plan.

Special Status Species - Plant or animal species falling in any of the following categories (see separate glossary definitions for each):

- Threatened or Endangered Species
- Proposed Threatened or Endangered Species
- Candidate Species
- State Listed Species
- Bureau Sensitive Species
- Bureau Assessment Species

Species Diversity - The number, different kinds, and relative abundance of species.

Stand (Tree Stand) - An aggregation of trees occupying a specific area and sufficiently uniform in composition, age, arrangement, and condition so that it is distinguishable from the forest in adjoining areas.

Stand Density - An expression of the number and size of trees on a forest site. May be expressed in terms of numbers of trees per acre, basal area, stand density index, or relative density index.

Stand-replacement Wildfire - A wildfire that kills nearly 100 percent of the stand.

State Listed Species - Plant or animal species listed by the State of Oregon as threatened or endangered pursuant to ORS 496.004, ORS 498.026, or ORS 564.040.

Stream Class - A system of stream classification established in the Oregon Forest Practices Act. Class I streams are those which are significant for: 1) domestic use, 2) angling, 3) water dependent recreation, and 4) spawning, rearing or migration of anadromous or game fish. All other streams are Class II. Class II special protection streams (Class II SP) are Class II streams which have a significant summertime cooling influence on downstream Class I waters which are at or near a temperature at which production of anadromous or game fish is limited. Revised Forest Practices Act may have a new system within a year.

Stream Order - A hydrologic system of stream classification based on stream branching. Each small unbranched tributary is a first order stream. Two first order streams join to make a second order stream. Two second order streams join to form a third order stream and so forth.

Stream Reach - An individual first order stream or a segment of another stream that has beginning and ending points at a stream confluence. Reach end points are normally designated where a tributary confluence changes the channel character or order. Although reaches identified by BLM are variable in length, they normally have a range of ½ to 1-1/2 miles in length unless channel character, confluence distribution, or management considerations require variance.

Structural Diversity - Variety in a forest stand that results from layering or tiering of the canopy and the die-back, death and ultimate decay of trees. In aquatic habitats, the presence of a variety of structural features such as logs and boulders that create a variety of habitat.

Succession - A series of dynamic changes by which one group of organisms succeeds another through stages leading to potential natural community or climax. An example is the development of series of plant communities (called seral stages) following a major disturbance.

Suitable Woodland - Forest land occupied by minor conifer and hardwood species not considered in the commercial forest land ASQ determination and referred to as noncommercial species. These species may be considered commercial for fuelwood, etc. under woodland management. Also included are low site and nonsuitable commercial forest land. These lands must be biologically and environmentally capable of supporting a sustained yield of forest products.

Surface Erosion - The detachment and transport of soil particles by wind, water, or gravity. Surface erosion can occur as the loss of soil in a uniform layer (sheet erosion), in many rills, or by dry ravel.

Thermal Cover - Cover used by animals to lessen the effects of weather. For elk, a stand of conifer trees which are 40 feet or more tall with an average crown closure of 70 percent or more. For deer, cover may include saplings, shrubs or trees at least five feet tall with 75 percent crown closure.

Threatened Species - Any species defined through the Endangered Species Act as likely to become endangered within the foreseeable future throughout all or a significant portion of its range and published in the Federal Register.

Timber Production Capability Classification (TPCC) The process of partitioning forest land into major classes indicating relative suitability to produce timber on a sustained yield basis.

Transportation System - Network of roads used to manage BLM-administered lands. Includes BLM controlled roads and some privately controlled roads. Does not include Oregon Department of Transportation, county and municipal roads.

Understory - That portion of trees or other woody vegetation which form the lower layer in a forest stand which consists of more than one distinct layer (canopy).

Viable Population - A wildlife or plant population that contains an adequate number of reproductive individuals to appropriately ensure the long-term existence of the species.

Viewshed - The landscape that can be directly seen from a viewpoint or along a transportation corridor.

Visual Resources - The visible physical features of a landscape.

Visual Resource Management (VRM) - The inventory and planning actions to identify visual values and establish objectives for managing those values and the management actions to achieve visual management objectives.

Water Quality - The chemical, physical, and biological characteristics of water.

Water Yield - The quantity of water derived from a unit area of watershed.

Wetlands or Wetland Habitat - Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include, but are not limited to, swamps, marshes, bogs, and similar areas.

Wet Meadows - Areas where grasses predominate. Normally waterlogged within a few inches of the ground surface.

Wildlife Tree - A live tree retained to become future snag habitat.

Withdrawal - A designation which restricts or closes public lands from the operation of land or mineral disposal laws.

Woodland - Forest land producing trees not typically used as saw timber products and not included in calculation of the commercial forest land ASQ.